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The Nature of Competition Among Apple Processors in The Appalachian Area

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Chapter I

INTRODUCTION

Statement of the Problem

APPLE processors are an important outlet for apples in the Appalachian Area.[1] In recent years this outlet has been taking approximately one-half the crop. A relatively few processors buy apples in the area.

In 1952 the Federal Trade Commission (FTC) charged the principal apple processing firms in the Appalachian Area and a grower organization with: "(1) fixing, establishing and maintaining prices to be paid for apples for processing purposes; (2) fixing and establishing a mathematical percentage pricing formula for calculating the prices to be paid for various grades of apples and price differentials between such grades, and (3) diverting raw apples from one processor to another for the purpose of maintaining the prices thereof set by respondents, all in violation of the Federal Trade Commission Act."[2] The initial decision of FTC hearing examiner Hier dismissed the charges. This decision has been upheld through subsequent appeals.

There has been a growing concern as to how the price of apples for processing is established. At the present time growers are attempting to organize in order to bargain with processors on price. There appears to be some question as to the amount of competition among processors in the Appalachian Area.

Major Questions to be Analyzed

The objective of this study is to determine the nature and the amount of competition among apple processors in the Appalachian Area. The effects of competition are registered through price. Price is the focal point of our allocating mechanism; that is, it directs production and consumption and distributes incomes. Therefore the "perfectness" with which price performs its allocating functions is of interest to all. Is there strong

[1]The Appalachian Area refers to the commercial apple producing sections of Pennsylvania, Maryland, West Virginia, and Virginia. Figure 1 outlines the area. While the area extends from Roanoke, Virginia to Carlisle, Pennsylvania, the bulk of the production is concentrated in the section north of Winchester, Virginia.

[2]FTC Docket No. 6041, *Complaint* page 4. (All FTC reference materials are filed with the Federal Trade Commission in Washington, D. C. All future references will refer only to the docket number and page.)

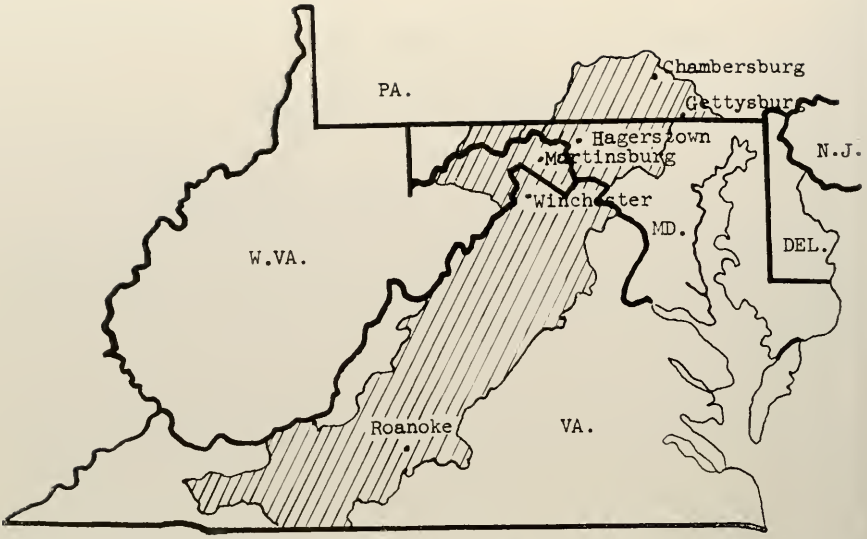

FIGURE 1. Appalachian Area (outline of commercial apple-producing sections of Pennsylvania, Maryland, West Virginia, and Virginia).

competitive pressure resulting in a price approaching the optimum, relative to the allocation and returns to resources? Or is there lack of competitive pressure among firms, resulting in inefficient use of resources? Are the marginal productivity and returns for comparable resources the same in all alternative uses? What factors tend to restrict competition? Also, what are the factors responsible for competition? How do these conflicting forces offset the effect of each other?

Method of Analysis

The analysis of this problem is approached by setting up in Chapter II certain criteria for identifying the firms included in the groups in which price is established. The price-making unit or market sub-group is classified in rather general groupings. This classification is on the basis of certain factors that affect the competitive pressure in a market sub-group, namely, power relation, ease of entry of new firms and whether a cooperative firm is present. The effect of these factors on competitive behavior is discussed.

In Chapter III an analysis is made of the national production and utilization of apples, with emphasis on the Appalachian Area's role in the nation's picture. This chapter gives the historical background necessary for the delineation of the market sub-groups involving the Appala-

chian Area. Therefore, Chapter IV is devoted to an actual delineation of the market sub-groups in the area and to the identification and description of the processor firms.

Chapter V is devoted to a description of operating policies and of the conditions confronting processors. In other words, it describes the behavior of processors. Chapter VI interprets processors' behavior in terms of competitive pressure.

Chapter VII presents a summary of the study and the conclusions which were drawn from the analysis.

Sources of Data

Data relative to production, utilization, and price of apples were obtained from reports of the Crop Reporting Board, Agricultural Marketing Service (AMS), United States Department of Agriculture (USDA). The study is confined to the period since 1934 and to commercial areas only. This was done because of the difficulty of obtaining data prior to 1934 and because most of the important developments among processors in the Appalachian Area have occurred since then. In 1934 the USDA Crop Reporting Board limited its estimates to commercial areas in 35 states. Consequently, data prior to 1934 are not comparable to those since 1934. In 1950 only 1 per cent of total national apple production was produced in the other 13 states. Prior to 1936 very little data were available relative to individual processors. Also, most of the changes which are of interest to this study have occurred since 1934

In a study concerned with the nature of competition among a few firms it is essential to have data relative to the operations and behavior of individual firms. These data often are either not available or rather limited. However, in this study considerable data pertaining to individual processing firms and also statements as to their competitive behavior were obtained from the records of the *Office of Price Administration* (OPA), from the *Office of Price Stabilization* (OPS), from FTC, and from the individual processors. Although the data are not available for all years and often are limited as to details, it is felt that they are adequate for purposes of this study.

Data pertaining to the production of sauce and slices were obtained from the National Canners Association. (National Canners Association data referred to are on file with the Division of Statistics, National Canners Association, Washington, D. C. Future references will refer only to National Canners Association data.)

Chapter II

IDENTIFICATION AND CLASSIFICATION OF THE PRICE-MAKING UNIT

THE purpose of this study is to determine the nature of competition among apple processors in determining price. In order to answer this question the market and its structure must be defined rather closely.

Identification of the Price-Making Unit

THE CONCEPT OF A MARKET

Marshall defined a "perfect market" as follows:[3] ". . . a district, small or large, in which there are many buyers and many sellers all so keenly on the alert and so well acquainted with one another's affairs that the price of a commodity is always practically the same for the whole of the district." The *Encyclopedia of the Social Sciences* defines a market as follows:[4] ". . . the area within which the forces of supply and demand converge to establish a single price." Waite and Trelogan say that a market is[5] "A sphere within which price-making forces operate and transfers of ownership are consummated." Papandreou and Wheeler consider a market to be:[6] ". . . the forces which underly some set of purchase and sale transactions, namely the forces of supply and demand."

There is a need to go further than this general and abstract concept of a market in delimiting the firms to include in an empirical study. Such a study deals with social forces and therefore it is difficult to identify the boundaries of a particular market and set it apart from other markets.

CRITERIA FOR GROUPING SELLERS

Papandreou and Wheeler suggest that the boundaries of a particular market may be deliniated by the identification of the group of buyers and sellers affected by common forces of supply and demand.[7] The

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[3]Alfred Marshall, *Principles of Economics, An Introductory Volume*, Macmillan and Co., 1947, p. 112.

[4]*Encyclopedia of the Social Sciences*, Vol. IV, p. 131, 1933 edition.

[5]Warren C. Waite and Harry C. Trelogan, *Agricultural Market Prices*, 2nd edition, John Wiley and Sons, Inc., 1948, p. 128.

[6]Andreas G. Papandreou and John T. Wheeler, *Competition and Its Regulation*, Prentice-Hall, Inc., 1954, p. 20.

[7]Many of the ideas discussed throughout this chapter are the outgrowth of lectures by Professors Papandreou and Cochrane. The same ideas are given a fuller coverage in (a) *Competition and Its Regulation*, Prentice-Hall, Inc., 1954, Chapters 2 and 4, and (b) *The Market as a Unit of Inquiry in Agricultural Economics Research*, by Willard W. Cochrane, published in the February, 1957 issue of *Journal of Farm Economics*, Vol. XXXIX, No. 1, pp. 21-39.

identification of sellers affected by common forces of supply and demand may be accomplished through the use of a cross-demand schedule. By cross-demand schedule, or curve, is meant the relation between the quantity demanded of the product of one firm and the price quoted on the product of some other firm, on the assumption that tastes, incomes, and other prices are given. The shape of the cross-demand schedule of two firms indicates the character of the relation between the demands for their products.

The nature of the cross-demand curve may be summarized as follows: If the cross-demand curve relating two products is constant (a horizontal line) the two products are independent, and the firms concerned with the two products are not subject to common market forces. If the cross-demand curve is not horizontal, then the two firms are subject to common market forces. If the cross-demand schedule is generally increasing from left to right, the two products are substitutes for one another; and if it is generally decreasing from left to right, the two products are complementary to one another.

Papandreou and Wheeler suggest that in describing the schedules the word *generally* precede either increasing or decreasing to indicate that its general shape suggests an increase or a decrease.[5] It is possible that some of the points of the schedule may lie on a horizontal line. This, however, is consistent with a *generally* increasing or decreasing schedule. The more nearly two products are substitutable for each other, the steeper will be the cross-demand curve and the more the firms concerned with the two products will be subject to common forces of supply and demand. Also, the less two products are substitutable for each other, the less sloping the cross-demand curve will be, and the less the firms concerned with the two products will be subject to common forces of supply and demand.

If two firms sell either complementary or substitute products, they are subject to common forces of supply and demand. However, the nature of the relationship of the two firms is quite different in the two cases. If the two firms sell substitute products, the nature of the cross-demand curve is essentially a competitive one. On the other hand, if the two firms sell complementary products, the nature of the cross-demand curve is essentially a cooperative one. Since this study is concerned with the nature and extent of competition among apple processors in the Appalachian Area, the analysis will be concerned with whether or not the firms find themselves—through the market—in a competitive

[5] Papandreou and Wheeler, op. cit., p. 29.

relationship with respect to each other. Therefore, the criterion for grouping firms together will be whether or not they are selling or buying substitute products.

Using the cross-demand schedule as a criterion for grouping firms, it is easy to see that some price of one product can be found which will affect the demand for many other normally unrelated products. These extremely high or low prices may be considered unrealistic or likely never to occur. Therefore the grouping of firms will be restricted to the meaningful part of the cross-demand schedule in order to avoid grouping together firms which never really find themselves in a competitive relationship.

CRITERIA FOR GROUPING BUYERS

The criteria for grouping buyers together are quite similar to those used for grouping sellers. To the buyers the concept of cross-supply schedule is analogous to that of cross-demand schedules for the sellers. If two buyers are substitute outlets, their cross-supply schedule will be generally decreasing or downward-sloping. Therefore, all firms with a generally downward-sloping cross-supply schedule will be in the same market groups.

MARKET SUB-GROUPS

So far the concept of a market has been limited only by whether the products of any two firms are substitutes. It is desirable to limit the scope of the market to prices which may be meaningful in the sense that they are likely to occur within some prescribed range. It was pointed out that the matter of substitution is not a matter of being perfectly substitutable or of being perfectly independent but generally a matter of imperfect substitutability and the extent of substitution is indicated by the general shape of the cross-demand schedule. This still leaves a rather heterogeneous group of firms in the same market. For example, apple processors in the Appalachian Area and fresh market apple buyers in the same area are certainly buying substitute products and offering substitute outlets for the same products. However, the two groups of buyers may be confronted with quite different problems.

To analyze price behavior it may be useful to narrow the area under consideration to a more uniform group. Papandreou and Wheeler suggest that this be done by the concept of an industry.[9] By industry they mean that the firms in question display a similar structural pattern.

[9]Ibid., Chapter 4.

The phrase, similar structural pattern, indicates that the firms have similar technological, market, and organization problems. In other words, all pertinent conditions confronting the firms in the same industry are similar. Industry grouping usually falls along product lines. The concept of an industry provides the criteria for narrowing the market to an analytically meaningful size. The market sub-group consists of all the firms that belong to the same market group and at the same time belong to the same industry. It includes all the firms that sell substitute products and have similar structural patterns. The market sub-group becomes a common unit of inquiry. The firms are relatively homogeneous, confronted by similar problems and in relatively close competitive relationships. It is within this unit that sellers actively compete with one another, buyers and sellers actively bargain with one another, and price is formed.

RELATIONSHIP OF A MARKET SUB-GROUP TO A MARKET PLACE

A market sub-group has been defined as comprising all the firms selling substitute products and at the same time having similar structural patterns or belonging to the same industry. A market place may be defined as comprising the area in which ownership of the product changes hands. The market sub-group may be made up of many or few market places, depending upon the particular sub-group under consideration. For example, there may be hundreds of market places where fresh apples change hands, but the United States may make up only one market sub-group. The market places are the areas of operation of the market sub-group. They are linked together by high degree of substitution of sellers between market places. Any one market place may or may not play an important part in establishing price, but market places taken together make up the market sub-group.

It is not necessary that supplies move between two market places for both market places to be in the same market sub-group. However, the important thing is that if price between the two market places varies more than cost of transportation, supplies will shift from one to the other.

RELATIONSHIP AMONG MARKET SUB-GROUPS

Market sub-groups are linked together by a network of substitution among the sub-groups. The degree of substitution between two sub-groups affects the elasticity of the supply or demand curves of the sub-groups. Assuming that fresh apple buyers make up one market sub-group and processor buyers another, and that sellers are indifferent as

to which sub-group they sell, there will be a high degree of substitution by sellers between the two sub-groups. This will affect the shape of the supply curve of the two sub-groups. On the other hand, assuming that the processors in the Appalachian Area make up the buyers of one sub-group and the processors on the west coast another, and assuming that transportation costs relative to processor prices prohibit sellers from substituting one market sub-group for another, the supply curves of the two sub-groups will be independent of each other. Also, institutional barriers may limit the substitution between market sub-groups or even limit the firms included in a sub-group. For example, quotas and tariffs restrict the movement of apples between the United States and Canada. In summary, the degree of substitution between market sub-groups determines the nature of the demand and supply curves for the sub-groups.

Classification of Market Sub-Groups

Classification of market sub-groups may be made on the basis of the structure of the group. By structure is meant those factors which have a significant influence on the conduct or behavior of the decision makers in establishing prices.

Two structural elements immediately come to mind when we consider market classification, (1) the number in the market, and (2) product differentiation (or its lack, product homogeneousness). These two elements determine the power relations among firms in a market sub-group. They determine the ability of one firm to influence the behavior of other firms in the market sub-groups.

POWER RELATIONS

If the products of two firms are homogeneous, a cut in price by one will lead to a reduction in sales of the other. For this to take place, two conditions must be present: (1) the buyers must be willing and able to buy one or more units of the product at the quoted price, and (2) the sellers must be willing and able to place these units on sale at the quoted price. This immediately raises the question of the ability of a firm to follow an independent pricing policy. In other words, can one firm force other firms to follow, or does it produce such a small part of the total supply of the product that it is unable to make a price change effective.

CROSS PURCHASE AND CROSS-SALES SCHEDULES

It was found helpful to consider only the meaningful part of the cross-demand or cross-supply curves. For any given firm, it also seems necessary to consider only the meaningful part, or that part of the cross-demand or cross-supply curves over which it can make a price change effective by its ability to buy or sell a sufficient quantity of its product to satisfy the demand at the quoted price. Papandreou and Wheeler suggest the use of the term cross-purchase and cross-sales schedules.[10] The cross-purchase or cross-sales schedules differ from the cross-demand or cross-supply schedules in that the former depicts the nature of substitution of two products over all conceivable alternative prices and quantities, whereas the latter refers only to the prices and quantities which a firm has the capacity and resources to make effective. The cross-purchase and cross-sales schedules become important when considering the power relationship among firms. For example, under conditions of perfect competition, any firm is unable to affect the sales of any other firm measurably because of its inability to supply the market sub-group at lower price. On the other hand, under conditions of oligopoly, a firm may be able to affect the sales of other firms due to its ability to supply the market sub-group at a lower price.

NUMBER OF FIRMS IN THE GROUP

The significance of the number of firms in a market sub-group is registered by whether a firm can affect the sales of other firms by changing its own price. Therefore, the absolute number of firms is not the important thing but rather the power relations or ability of one firm to affect the behavior of others. A firm may find itself in one of four power relations in a market sub-group, (1) atomistic, (2) circular, (3) dominant, or (4) unique (single seller).

The relationship is atomistic if any firm lacks power to affect measurably, through a change in price, any other firm in the market sub-group. This would involve a relatively large number of firms and each firm may be decsribed as a price taker in that it is impotent in effecting a price change by itself.

The relationship is circular if any firm has the power to affect the sales of any other firm in the market sub-group by a change in price. There are relatively few firms in a circular group. In this group a firm may be described as a price maker in that it has the power to change price and make it effective. The degree of the effect of price change of

[10] Ibid., pp. 38-44.

any one firm on the sales of any other firm in the market sub-group may vary from only slight to complete, namely, taking all the customers from the other firms. The extent of the effect is determined by whether or not the products of the firm are homogeneous or differentiated. This will be discussed later.

The relationship is one of dominance if one firm can affect the sales of another firm by cutting price but the second firm cannot affect the sales of the first firm by cutting price. One firm has power with respect to the other, but the second is completely impotent with respect to the first. Dominance is the combination of a circular and atomistic relationship. A few dominant circular firms with several atomistic small competitive firms give probably the most important power relation that will be found among processors of agricultural products.

The unique firm or single seller is the only firm in a sub-group. Therefore, it will be a price maker, and competitive pressure will have to come from some firm in another sub-group. A monopolist will represent an isolated seller.

The number of firms in a sub-group largely determines whether the power relation among a group of firms is atomistic, circular or single seller. However, the degree of product differentiation plays an important part in the competitive behavior of the firms in a group, particularly in a circular sub-group where there is some freedom of choice as to behavior on the part of the individual firms.

PRODUCT DIFFERENTIATION

Product differentiation has reference to the degree of substitution. If the product is homogeneous the substitution is perfect. However, if there is differentiation, substitution is less than perfect, the degree depending upon the extent of differentiation.

Whether or not the product is differentiated has an influence on price behavior. Under a circular or oligopoly situation, with a homogeneous product, there is perfect oligopoly, or everyone must sell at the same price; but with a differentiated product there is imperfect oligopoly, as everyone does not have to sell at the same price.[11] In the case of perfect oligopoly, if one firm cuts its price, all other firms must immediately follow or they will lose all their sales to the firm which cut price; this is assuming that the firm could supply their product in sufficient quantities. In the case of imperfect oligopoly there is differentiation of the product.[12]

[11] Kenneth E. Boulding, *Economic Analysis*, rev. ed., Harper and Brothers, 1948, pp. 581-587.
[12] Ibid., pp. 588-591.

Therefore, a price cut by one firm will not immediately attract all of the customers of the other firms. Retaliation is slow, or may not occur, depending on the degree of product differentiation. In Chamberlin's large numbers case, product differentiation is the essential element for monopolistic competition; otherwise the case would be pure competition.[13] In the case of large numbers the firm is faced with a perfectly elastic demand curve if the product is homogeneous (pure competition); whereas with a differentiated product there is some slope to the demand curve, depending upon the degree of differentiation (monopolistic competition).

The degree of substitution is the criterion used to distinguish or to classify together units of goods as homogeneous or differentiated. Therefore, the same product, at different places may be called different products. The cost and inconvenience of transporting the product from one place to another determine the degree to which the product is differentiated due to location. If the cost of transporting is higher relative to price, the degree of differentiation is also high, whereas if the cost is low relative to price, the degree of differentiation is low.

Closely related is the matter of substitution of a product through time. If a product can be easily stored (stored relatively cheaply), it affects the nature of the supply curve of the product. Also, it may increase the capacity of a firm, and this would tend to increase the degree of circularity. For a given level of substitution, the greater the excess capacity of a firm in a sub-group, the greater the circularity.

THE EFFECT OF A COOPERATIVE ON PRICE BEHAVIOR

Historically, cooperatives are pictured as a means whereby users increase their returns or decrease cost, provided present alternatives are inefficient or "excess profits" are made by present firms performing the service. "Normal profits" are considered as part of total cost and necessary if a firm is to stay in business. "Excess profit" is the difference between total profits and "normal profits." In a circular sub-group excess profits are expected. How does a cooperative as a member of a circular sub-group affect the price behavior and profits of the group?

An illustration serves to show how a cooperative brings competitive pressure on other members of a sub-group. Assume that the buyers in a market sub-group of apple processors are made up of two firms identical in every respect except that firm A is a cooperative and firm B is an ordi-

[13] Edward Hastings Chamberlin, *The Theory of Monopolistic Competition, A Re-orientation of the Theory of Value*, 5th ed., Cambridge, Harvard University Press, 1947, pp. 90-94.

nary corporation. Since the two firms are identical, except that one is a cooperative, their costs of processing and distributing processed products will be identical. To simplify the illustration it is assumed that the cost of processing and distributing their products is constant at all outputs, except for the cost of apples for processing.

AGR in Figure 2 represents average gross revenue or demand for processed apple products for the sub-group which is composed of two firms. Since the cost of processing and distributing is identical and constant at all outputs for both firms, the derived average revenue or demand for apples of the sub-group lies below AGR by a constant amount. In Figure 2 DDAR represents the derived demand curve for apples for the sub-group. The area between AGR and DDAR represents the cost of processing and distributing for the sub-group.[14]

Since each firm has one-half the total derived demand, DM is the demand curve for apples for each of the firms, as it is one-half of DDAR. DM is also the average revenue curve for each of the firms, and DR is marginal revenue. It is assumed that SS is the supply curve of apples for

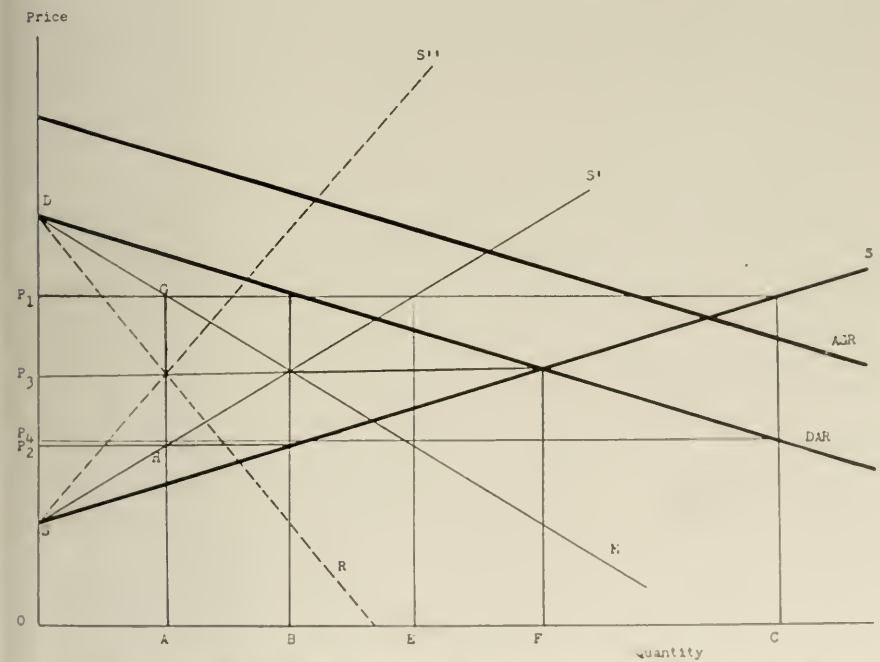

FIGURE 2. Hypothetical market sub-group situation involving a cooperative.

[14]For a detailed treatment of the derived demand for an industry see, William H. Nicholls, *A Theoretical Analysis of Imperfect Competition with Special Application to the Agricultural Industries*, Iowa State College Press, 1941, pp. 31-38.

the two firms. SS' is the supply curve each firm faces, as it is one-half of SS. SS' also is the average cost curve of apples for each firm. Assume that firm B sets a price to be paid for apples. Firm B would set a price at P_2, taking quantity OA and selling at price P_1, giving a net profit of P_1GHP_2, which is at a maximum. This is also the maximum for firm A.

However, unlike firm B, firm A pays price P_1 to its members, returning all profits in patronage dividends. Since growers are indifferent as to which firm they sell, they will be unwilling to sell to firm B at P_2 when firm A is paying P_1. Consequently, to meet the competition from A, firm B will be forced to raise its price.

This situation leaves the apple sellers dissatisfied. At a price of P_1 they are willing to sell a total quantity of OC, or OE amount to each firm. However, the processor derived demand will take only OB quantity at price P_1. With OC quantity the sub-group can only get price P_4. This is less than they paid for apples, therefore, processors will reduce the price paid for apples. As processors reduce their price for apples, growers are willing to sell fewer apples and processors can sell a larger quantity of apple products without incurring a loss. This process will continue though successive price reductions for apples until price reaches P_3.

At price P_3 growers are willing to sell quantity OF, and the processors are able to sell that quantity. The processors are making normal profits, or sufficient to stay in business. They are not making excess profits as previously. However, if they take a quantity less than OF, and firm A continues to return all over cost of operation to growers, the price will be forced back to P_3, each firm taking quantity OB. Therefore, if we assume that all firms are identical, that growers are indifferent to which processor they sell, and that the cooperative returns all over cost to the apple sellers, profits will be reduced to normal or that amount necessary to keep the processors in business. Average costs will equal average revenues as under perfect competition, provided production costs per unit are the same under imperfect and perfect competition.

The illustration on the effects of a cooperative assumes that there is nothing to dampen the effect of the price paid by the cooperative, and that the operation of the cooperative is quite responsive to the demands of its patron members. These two assumptions need closer examination. Although a cooperative is organized on a somewhat different basis from that of an ordinary corporation relative to the distribution of "net

returns," control, returns on capital, and ownership of stock, it is quite possible that in practice the two may have similar operating practices. However, the important point is that the cooperative has forced some of its practices on the other firms, namely that of returning excess profits to apple growers.[15]

Is there anything in the operational procedures of a cooperative to dampen the full effect of the price which it pays? The answer is yes. Generally the full price to be received is not known until after the apple grower has decided what part of his crop he will sell to the processor. Also, cooperatives often return only part of the full price in cash. All this tends to dampen the full effect of the cooperative. However, if a cooperative performs as assumed in Figure 2 such action will set a pattern as to the expectations of members, which will tend to offset the dampening effect.

EASE OF ENTRY

The ease of entry of new firms in a sub-group is certainly a factor affecting the behavior of the firms in a sub-group. (The ease of entry and threat of potential new firms may have a moderating effect on firms already in a sub-group.) Existing firms may fear that the presence of high excess profits will attract new firms to the sub-group. Therefore, ease of entry is a structural factor to be considered. Ease of entry is closely related to the number of firms and has a direct influence on numbers.

Papandreou and Wheeler say that entrance is free if—[16] "A firm can become a member of a group on terms which are at least as favorable as those which are available to the firms which make up the group in question." The important thing about freedom of entrance is the absence of a differential advantage for the firms already in a group.

The optimum size of the firm is an important consideration relative to ease of entry. It is harder for a firm to enter a sub-group if the optimum size of firm is large than if it is small. It may also be easier to enter a sub-group in which demand is expanding than it would to enter one in which the demand for the group's product is constant, as existing firms would suffer less reduction in output.

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[15]For a theoretical treatment of output and price of a cooperative see Richard Phillips, *Economic Nature of the Cooperative Association*, (Unpublished Ph.D. Thesis), Iowa State College Library, Ames, 1952, pp. 149-246, also *Journal of Farm Economics* Vol. 35, Feb. 1953 No. 1 p. 75.

[16]Papandreou and Wheeler, op. cit., p. 177.

Entry of new firms may change the power relation of a group of firms, possibly causing a circular group to become atomistic. In general, it is concluded that the greater the ease of entry, the stronger is competitive pressure.

CONCLUDING REMARKS ON STRUCTURE

This is not intended to be an exhaustive coverage of structural factors that influence behavior of firms in a market sub-group; it is intended to point up, from market structure theory, points important to this study. Certainly the power relationship among firms is important. The number of firms in the group seems to be the key factor in determining power relations. The effect of numbers may be modified by the degree of substitution. Substitution includes the degree of differentiation between the products of any two firms in a group. Also, it includes substitution through time and space. The presence of a cooperative modifies the behavior of a group. The entry of new firms also tends to bring competitive pressure in a group. In fact, it may even change the classification of the power relation. There may be many other factors. For example, the relative costs among firms may affect their behavior. Certain factors may affect a circular group and not an atomistic group, due to the lack of freedom in the latter. For example, processors in the Appalachian Area are concerned about the future supply of apples for processing. Therefore, a processor in a circular or dominant group who is looking forward to a relatively long period of operation may be in a position to take some action toward insuring a future supply of apples, whereas a fresh buyer in an atomistic group could not do so. Some of these aspects, as well as others, will be explored further as to their effect on competitive pressure in the case under study.

In perfect competition, or where the relationships are atomistic once the demand and supply curves for the market sub-group have been defined, price and output may be predicted. This is not true with monopolistic groups where the relationship is circular.

Some of the factors which affect price behavior have been discussed. The effect of factors considered may be viewed in terms of probability. The probability is greater that the firms will behave as indicated, but due to the alternatives open to them, they may follow some other pattern. The effect of two factors present may be in conflict, and thus the influence of one will be weighed against the influence of the other. Two quotations from Nicholls emphasize the importance of caution in using empirical data to test theoretical models developed on an abstract plane.

Quoting from Nicholls:[17] " 'All market situations must be approached on their own merits. Preconceived notions of . . . oligopoly situations are just as likely to throw one off the track as to yield light. We are in the realm of things where individual decision plays an enormously important role. The capricious . . . and irrational or mistaken judgment of one member of a market may be far more important than all the theoretical generalizations there are.'" Who would deny that price policies would not have been differ-

"7 Dr. J. K. Galbraith, in a letter to the author. For the spicy and pointed views of 'economic theology' by an antitheorist, see: Walton Hamilton, 'Industrial Inquiry and Sectarian Dogma,' Am. Econ. Rev., Vol. 29 (1939), pp. 102-103."

ent in an automobile industry without its Ford or a tire industry without its Firestone?"

"8 See Lloyd G. Reynolds, 'Competition in the Rubber-Tire Industry,' Am. Econ. Rev., Vol. 28 (1938), pp. 467-68."

"We must, therefore, realize that our analysis of oligopoly-oligopsony has of necessity proceeded on a very abstract plane. It has presented a series of models which should be very helpful in empirical work. But this is true only if we are careful to avoid the common failing of empirical studies in economics whereby 'the existing theoretical analysis of an assumed set of circumstances is simply applied to a more complex set of facts and offered as a complete explanation of the outcome.'[9]

"9 Prof. Donald H. Wallace of Williams College, a competent authority in this field, in a letter to the author."

"In the study of any given industry, the assumptions by which dominant firms eliminate or fail to eliminate the influence of circular interdependence must be 'carefully chosen on the basis of empirical, factual investigations'[10]."

"10 Triffin, p. 78."[18]

POWER RELATION BETWEEN BUYER AND SELLER

A market sub-group has been defined as the unit of inquiry. Each market sub-group is composed of a group of buyers and a group of sellers. So far this study has been concerned with the relations among groups composed of either sellers or buyers. Power relations also exist between buyer and seller groups. If neither buyer nor seller wields any power over the other, their relationship is atomistic. If they each wield power over the other the relation is circular. If either the buyer or the seller wields power, but the other does not, the relation is one of dominance. It is only when the relations between buyers and sellers are circular that bargaining can take place. When the relations are circular, both groups wield power and are in a position to bargain.

[17]William H. Nicholls, *A Theoretical Analysis of Imperfect Competition with Special Application to the Agricultural Industries*, Iowa State College Press, Ames, 1941, pp. 151-152.
[18]Ibid., p. 152.

Chapter III

HISTORICAL BACKGROUND OF PRODUCTION AND UTILIZATION OF APPLES

IN Chapter II an attempt was made to set up certain theoretical concepts for identifying the price-making unit to which a particular firm or group of firms belongs. Also, some ideas were advanced regarding the structural factors which would effect the competitive behavior of the firms in a market sub-group. These procedural or methodological concepts serve as a guide to the researcher in setting the stage for the analysis of a problem such as is being undertaken in this study.

The buyers and sellers of apples in the market sub-group involving the apple processors in the Appalachian Area must be identified and their competitive behavior analyzed, in order to evaluate the nature of competition among apple processors in the Area.

As a point of departure, a brief historical account of the production and utilization of apples is presented, with particular emphasis on the Appalachian Area. This account will give some idea of the environment in which apple sellers and buyers in the Appalachian Area operate.

Production

Production of apples has been reported in every state, but commercial production is limited to about 35 states. According to the 1950 Census of Agriculture, only 1 per cent of the total national apple production was in the 13 states where commercial production was not reported. In 1934, the United States Department of Agriculture's Crop Reporting Services began reporting production and utilization of apples for commercial areas, and since 1938 has confined its estimates only to commercial areas in the 35 states. Consequently, observations will be confined to the period of 1934 to 1954.

Figure 3 shows the distribution of apple trees in the United States in 1950. The bulk of the commercial production is concentrated in a few areas. Washington state is the most important, accounting for about one-fourth of the commercial crop in recent years. The Appalachian Area is second, producing approximately one-fifth of the crop. New York

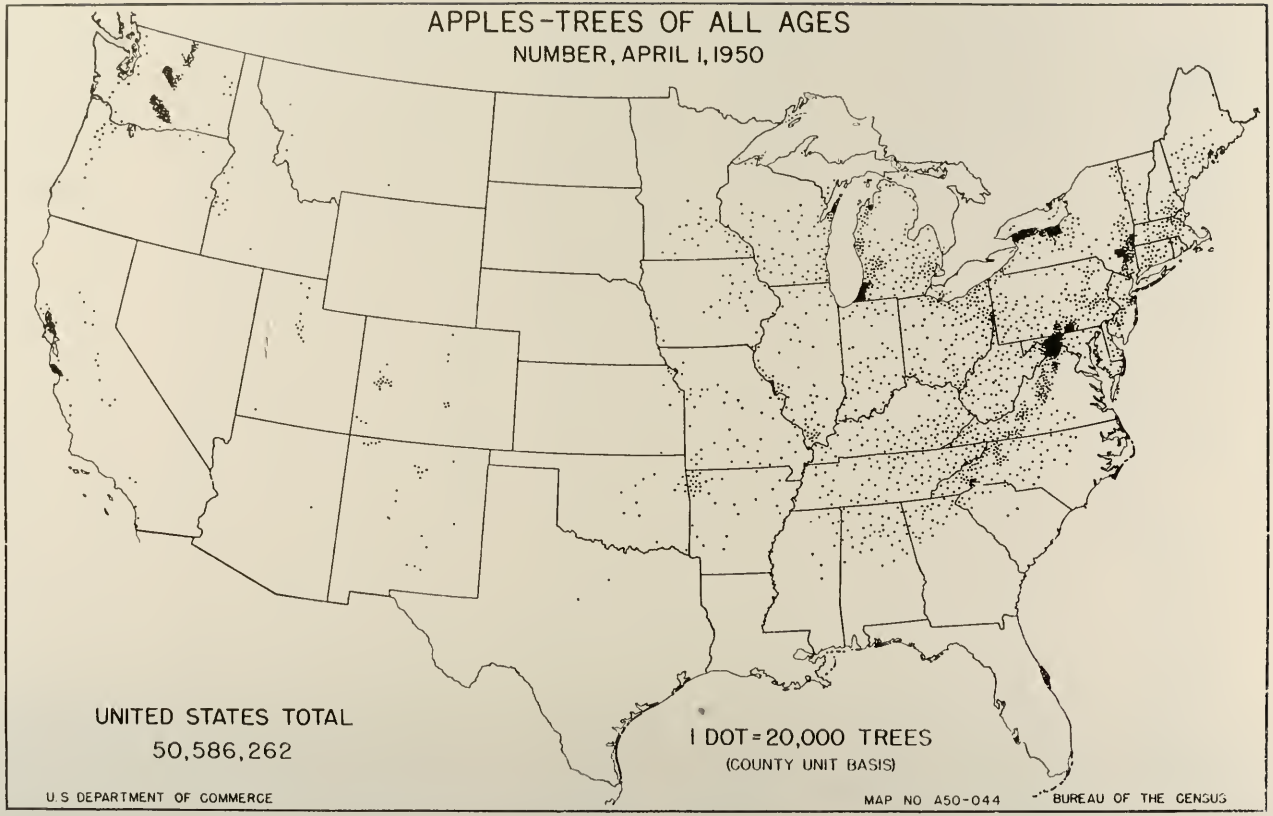


FIGURE 3. Distribution of apple trees—United States, 1950.

state is in third place, accounting for slightly less than the Appalachian Area. Michigan and California produce smaller, but important, quantities. The remainder, about one-fourth of the crop, is scattered over several states, mostly east of the Mississippi River. In summary, about two-thirds of the national crop comes from an area extending out from the Appalachian Area for a distance of about 500 miles, mostly to the north and west, Figure 3.

Average annual commercial production in the United States from 1934 to 1954 was 112,560,000 bushels, Figure 4. During the same period there was an average annual decrease of 1,126,000 bushels, Figure 4.

Production in the Appalachian Area has followed the same trend as that of the United States. It has tended to decline over the period 1934 to 1954, with an average annual decrease of 511,000 bushels, Figure 5.

Utilization

Although total national production has been declining, sales to the processors have been increasing. The average annual sales to the processors, from 1934 to 1954, were 28,760,000 bushels, or about 25 per cent of the crop, Figure 4. During the same period an annual average increase of 230,000 bushels was going to the processors, Figure 4.

The Appalachian Area also has experienced an increase in its marketings to processors. The average annual sales to processors in this area were 8,572,000 bushels, or about 37 per cent of the area's crop; and during the same period there was an annual average increase of 136,000 bushels going to processors, Figure 5. In recent years approximately one-half of the crop in the Appalachian Area has been sold to processors.

Variety and price are important factors in determining the utilization of the apple crop. The effect of price on utilization will be considered in some detail in Chapter V; the effect of variety will be given brief consideration at this point.

Although there appears to be a rather high degree of substitution among varieties of apples, some varieties are better suited for some uses than others. Red Delicious, McIntosh, and Winesap are generally preferred for fresh use, and Gravenstein, Greening, York, and Baldwin are preferred for processing. Stayman, Rome Beauty, Golden Delicious, and Grimes Golden are considered desirable by either the fresh or processing outlets. Table 1 gives production by area and variety for the period 1942-49. Although there is a rather wide distribution of each variety, the Appalachian Area and New York state produce a high proportion of the processing and dual-purpose varieties.

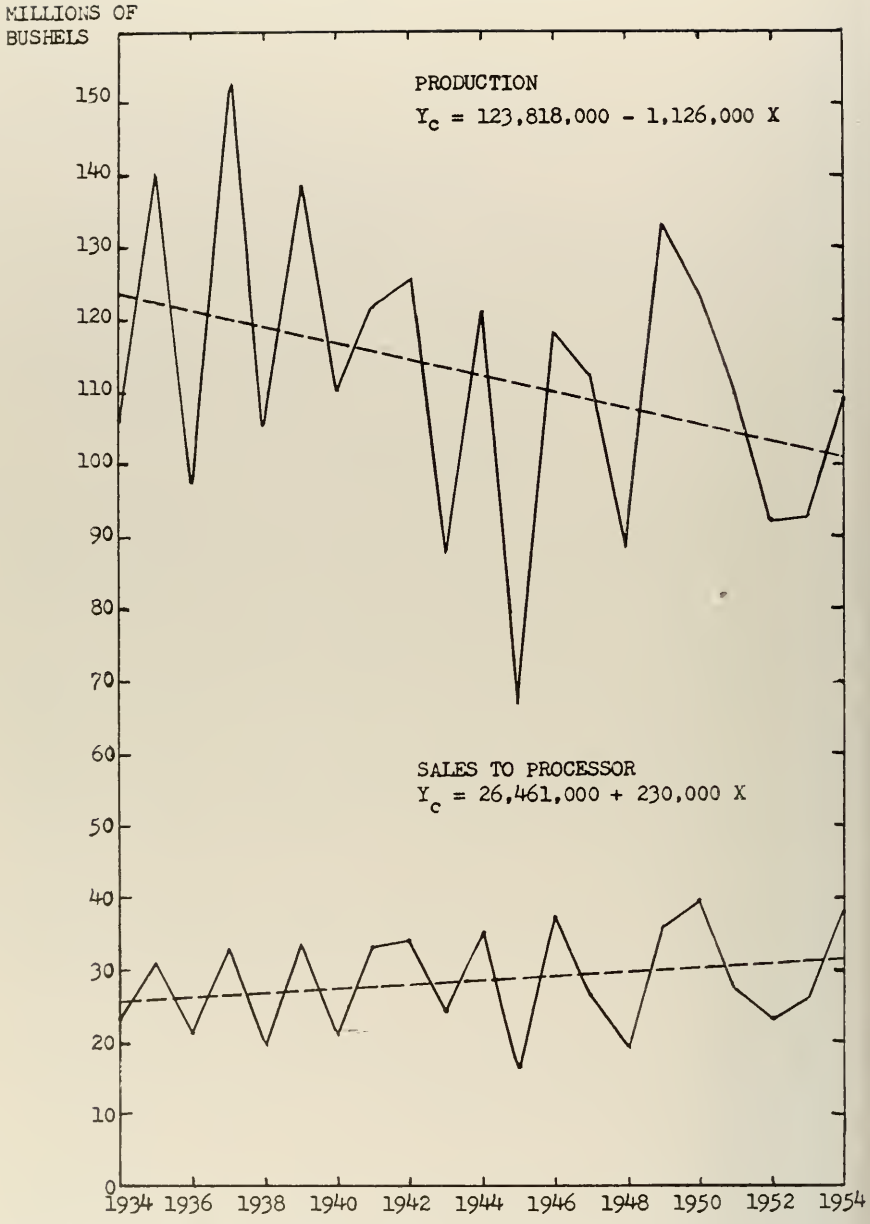


FIGURE 4. Apples—production and trend in production of commercial crop; sales to the processor and trend in sales, United States, 1934-54. (Source: United States Department of Agriculture, Crop Reporting Board.)

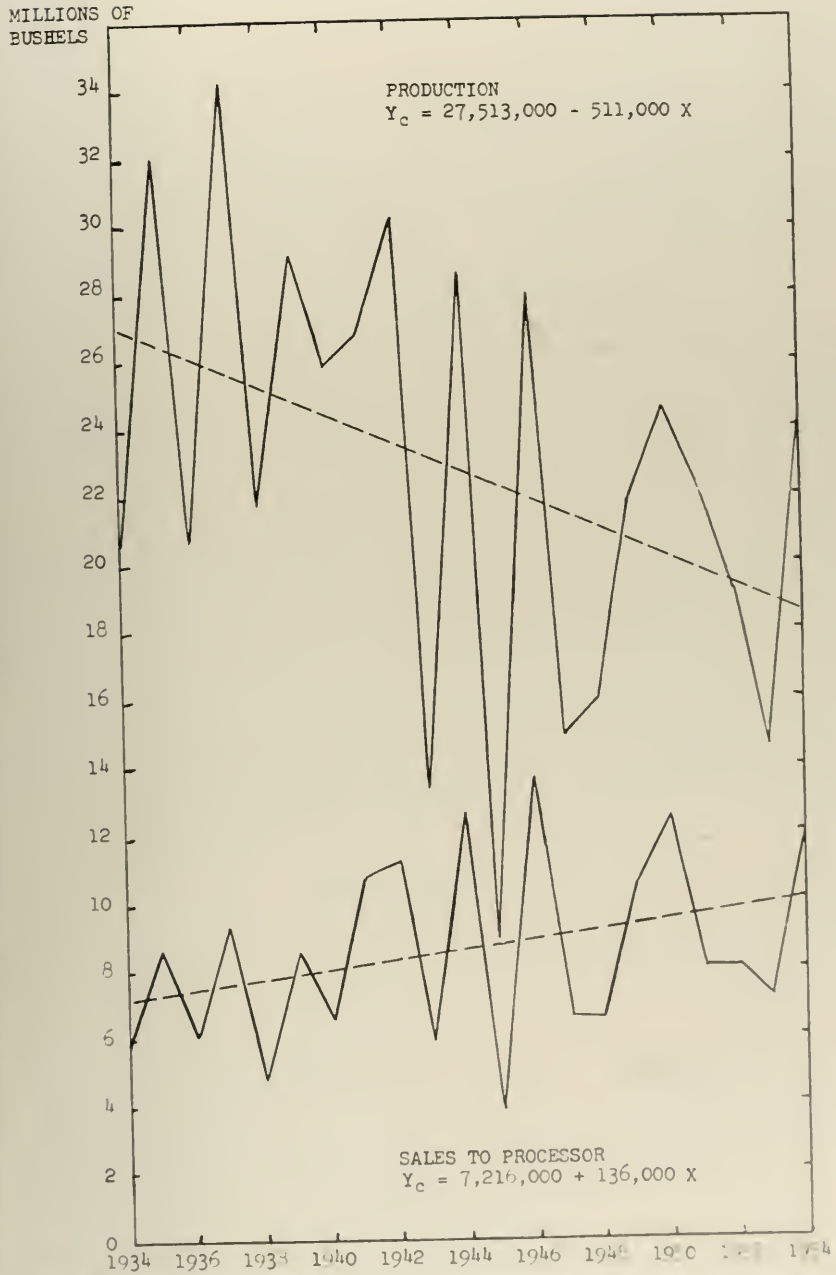


FIGURE 5. Apples—production and trend in production of commercial crop; sales to the processor and trend in sales, Appalachian Area, 1934-54. (Source: United States Department of Agriculture, Crop Reporting Board.)

Table 1. Percentages that Selected Varieties of Apples Were of All Apples Produced in Various Commercial Areas, 1942-49 — Average

Variety	Percent of All Apples Produced in Each Area							
	Appalachian Area	New England	New York	Total Eastern States	Total Central States	Washington	Total Western States	Total U. S. (35 States)
Summer Varieties	3.4	4.0	3.6	1.0	7.1	0.1	6.4	5.5
Total Summer Varieties	3.4	4.0	3.6	1.0	7.1	0.1	6.4	5.5
Fall Varieties:								
Grimes Golden	5.0	...	...	2.6	5.7	...	0.2	2.1
Joanthan	4.5	...	...	2.2	19.1	6.7	7.9	7.4
Wealthy	1.1	2.9	5.0	2.7	5.1	...	0.1	2.0
Total Fall Varieties	14.0	3.9	8.2	10.6	32.2	6.9	9.8	13.9
Winter Varieties:								
Baldwin	0.9	16.7	10.9	6.3	4.5	...	...	3.4
Ben Davis and Gano	3.9	0.6	4.8	3.5	2.4	...	0.7	2.1
Black Twig	3.2	...	...	1.7	0.1	...	0.1	0.8
Delicious	9.4	5.2	4.0	7.3	8.0	50.0	37.7	20.1
Golden Delicious	3.4	0.4	...	2.1	5.9	1.9	1.2	2.4
McIntosh	1.4	54.0	30.0	18.1	7.6	0.2	0.5	9.0
Northern Spy	0.3	3.9	4.8	2.2	4.6	...	...	1.7
R. I. Greening	0.1	1.6	13.3	4.5	1.2	...	...	2.1
Rome Beauty	5.8	0.4	4.7	5.6	4.6	6.0	7.1	6.0
Stayman	16.6	0.2	...	9.2	3.9	1.1	0.9	1.8
Winesap	7.2	...	...	3.7	2.2	31.4	21.8	10.9
Yellow Newtown	1.6	...	...	0.9	...	1.3	9.2	4.2
York Imperial	24.8	...	...	11.9	1.0	...	...	5.1
Total Winter Varieties	82.6	92.1	88.2	85.4	60.7	93.0	83.8	80.5
Total All Varieties	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Smith, Cecil N., *Some Recent Trends In The Appalachian Apple Industry*, Bulletin 462, Agr. Exp. Sta., Virginia Polytechnic Institute, Blacksburg, Virginia, June 1953, p. 25.

Table 2 gives the utilization of eight varieties in the Appalachian Area for the 1950 crop. Even though processors prefer certain varieties for processing, some like to use a blend of many varieties in making applesauce. Due to yearly variations in variety production, blending enables processors to produce a more uniform product than would be possible with only one or two varieties. Although some varieties are preferred for processing and others for the fresh market, all are used by both outlets. Price is important in determining whether apples will go to the fresh or to the processor outlet.

THE PRODUCTION OF APPLE SLICES AND SAUCE

Applesauce and slices account for a considerable part of all apples processed and have increased in importance over the past nineteen years. Figure 6 shows sauce and slices as a percentage of all processed apples in the United States. In the Appalachian Area applesauce and slices are more important than they are over the United States as a whole. Figure 7 gives this relation. Sauce and slices are important to apple processors in the Appalachian Area, and this area also is a major source of supply for the nation. Table 3 gives the total pack of sauce in the United States and the percentage packed in the various areas. The Appalachian Area supplies approximately one-half of the supply, followed by New York and California.

Table 4 gives the total pack of sliced apples in the United States and the percentage packed in the various areas and states. Again the Appalachian Area is a major source of supply, producing about one-half the total. It is followed by New York, Washington, and Oregon.

Summary

The Appalachian Area produces about one-fifth of the national commercial apple crop. Production has been declining both in the United States as a whole and in the Appalachian Area. There has been an increase in sales to processors during the past 20 years. Production of sauce and slices has expanded, particularly that of sauce. In the Appalachian Area approximately one-half of the crop has been sold to the processor outlet in recent years. Also, about one-half of the national production of sauce and slices is from the Appalachian Area.

It is with this production and utilization data, and the theoretical concepts outlined in Chapter II as a guide that the task of delineating the market sub-group involving apple processors in the Appalachian Area is undertaken.

Table 2. Production and Utilization of Selected Varieties — Appalachian Area 1950 Season.

Variety	Production	Percentage Sold To		
		Processor	Fresh Outlet	Others
	(Mil. Bu.)			
York Imperial	6.7	89.1	10.7	0.2
Stayman	2.8	54.5	45.1	0.4
Delicious	1.8	21.3	78.4	0.3
Winesap	1.7	17.5	81.4	1.1
Golden Delicious	1.1	70.2	29.7	0.1
Grimes Golden	1.0	80.8	18.5	0.7
Rome Beauty	0.9	34.8	64.8	0.4
Jonathan	0.7	68.3	31.1	0.6

Source: Smith, Cecil N., *Outlets Utilized by Cumberland-Shenandoah Growers in Marketing the 1950-51 Apple Crop,* Bulletin 461, Agr. Exp. Sta., Virginia Polytechnic Institute, Blacksburg, Virginia, page 19.

Table 3. Applesauce — Total Pack United States and Percentage Distribution by States or Groups of States 1934-1954.

Year	U. S. (Thousand Cases)	Percent of U. S. Pack			
		Md., Pa., Va., W. Va.	N. Y.	Calif.	Others
1934	1,892				
1935	1,887				
1936	2,353	48.9	49.7		1.4
1937	3,161	58.7	40.0		1.3
1938	1,526	44.7	54.7		0.6
1939	3,056	46.1	53.5		0.4
1940	2,634	62.1	36.9		1.0
1941	4,182	52.0	45.3		2.7
1942	4,590	59.7	37.0		3.3
1943	2,225	44.7	48.5		6.8
1944	4,301	64.3	28.3		7.4
1945	1,984	66.6	a		33.4
1946	8,239	57.3	27.5		15.2
1947	6,083	56.0	36.8		7.2
1948	4,851	60.2	31.6	6.3	1.9
1949	8,611	54.4	30.7	8.3	6.6
1950	12,541	53.4	31.8	7.3	7.5
1951	8,982	46.8	38.0	10.2	5.0
1952	8,914	46.7	32.1	15.8	5.4
1953	11,204	48.1	31.2	14.9	5.8
1954	15,294	48.2	32.8	14.0	5.0

a = Included in other states.

Source: National Canners Association data.

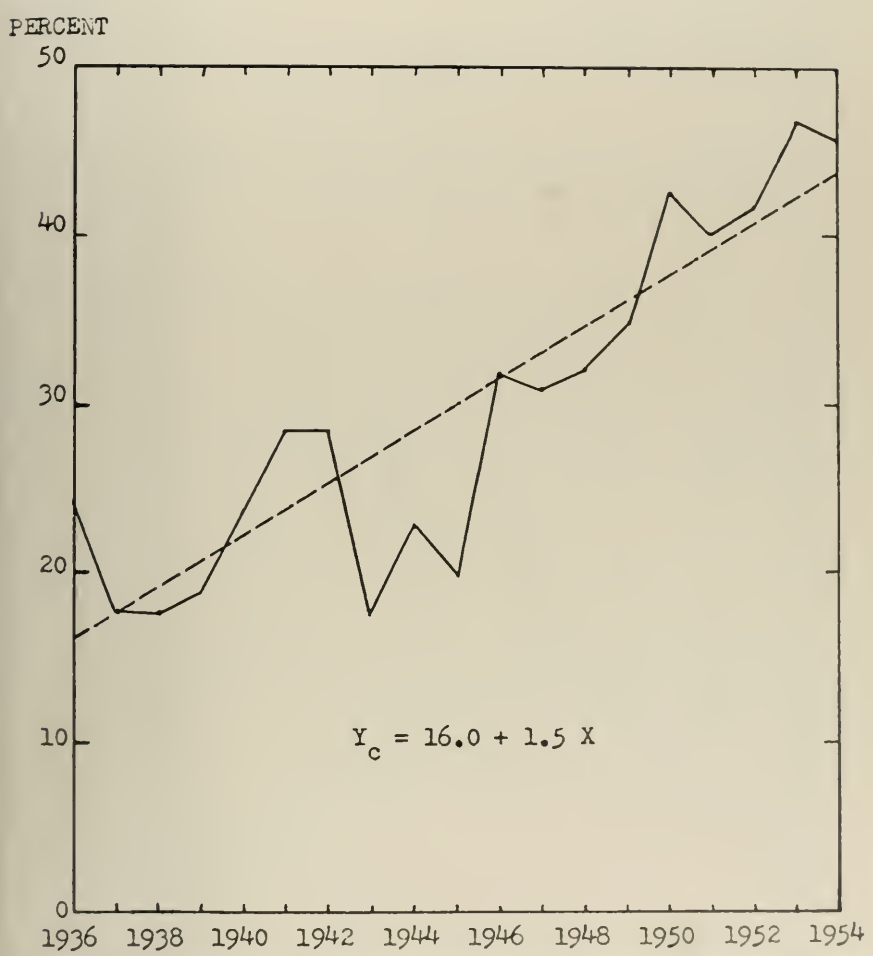


FIGURE 6. Applesauce and Slices as a percentage of all apples processed in the United States, 1936-54. (Source: Calculated from United States Department of Agriculture and National Canners Association data.)

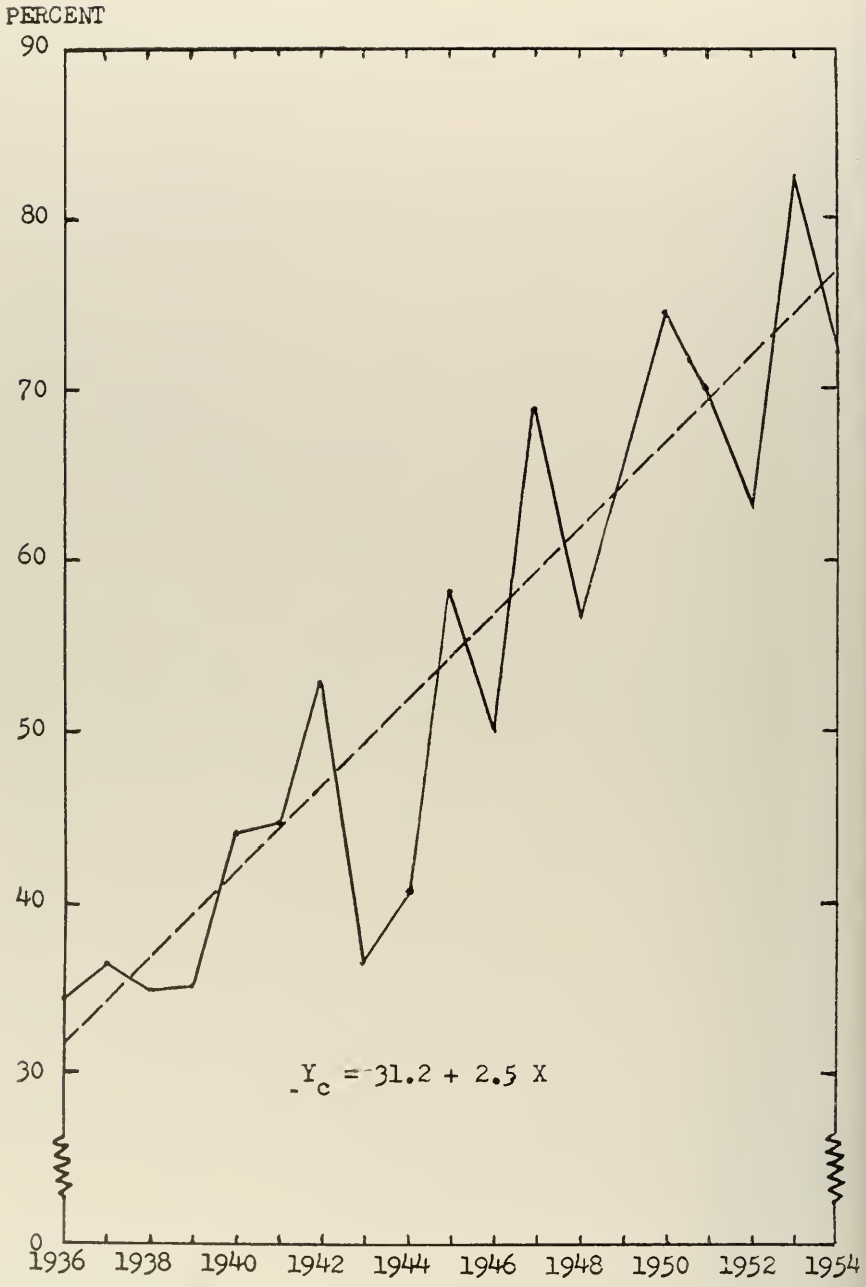


FIGURE 7. Applesauce and slices as a percentage of all apples processed in the Appalachian Area, 1936-54. (Source: Calculated from United States Department of Agriculture and National Canners Association data.)

Table 4. Sliced Apples — Total Pack United States and Percentage Distribution by States or Groups of States, 1934-1954.

Year	U. S. Thousand Cases)	Percent of U. S. Pack			
		Md., Pa., Va. W. Va.	N. Y.	Wash., Ore.	Others
1934	2,584	.	. .		
1935	2,331				
1936	2,620	34 2	4 1	59.1	2 6
1937	2,672	53 5	9.7	35 1	1 7
1938	1,750	49 7	11.6	37 1	1 6
1939	2,840	48.9	14.2	36 2	0.7
1940	2,249	52 8	13.7	32 5	1.0
1941	4,348	51 4	13.0	31 0	4.6
1942	4,164	61 4	15.6	21 6	1 4
1943	1,878	51.3	23 1	24 8	0 8
1944	3,355	60 8	18.7	19.0	1 5
1945	1,191	73 8	a	25 7	0 5
1946	3,266	58 6	22 7	14.1	4 6
1947	2,241	54 2	33 2	11 0	1 6
1948	1,687	58 5	28.5	11.9	1 1
1949	4,213	56 6	27 6	8 8	7 0
1950	5,264	59 5	21 9	11 7	3 9
1951	3,388	60 1	29 4	7 1	3 1
1952	2,560	60.8	27 5	8 6	3 1
1953	2,941	17 2	31 7	12 8	5 3
1954	4 709	56 0	27 9	9 7	6 4

a = Included in other states.

Source: National Canners Association data.

Chapter IV

DELINEATION OF THE MARKET SUB-GROUPS INVOLVING APPLE PROCESSORS IN THE APPALACHIAN AREA

CRITERIA for including firms in any particular market sub-group were outlined in Chapter II. They are: (1) any two firms must sell or buy substitute products, and (2) all firms must have similar structural patterns or be in the same industry. In Chapter III a rather general historical background of the production and utilization of apples was presented. This chapter is concerned with the problem of delineating the market sub-groups involving apple processors in the Appalachian Area.

In a market sub-group there are both buyers and sellers. As a point of departure, apple sellers will be considered first.

Apple Sellers

In using the concept of a cross-demand curve as a device to delineate the boundaries of a market group, it is necessary to select an anchor firm to which the cross-demand curve is to be linked.[19] If the cross-demand curve between the anchor firm and any other firms under consideration is positive, the firms involved are in the same market group. Any apple grower selling apples to processors in the Appalachian Area may be taken as an anchor firm.

SUBSTITUTABILITY

Assume that farmer A represents any apple grower-seller in the Appalachian Area. If farmer A cuts the price of his apples, does he affect the quantity sold by other farmers (sellers)? If so, what others? Does he affect only those in the Appalachian Area, all in the east, or all in the United States? In order to answer the question of substitution, it will be helpful to assume that farmer A can make any price change effective, that is, supply the quantity of apples necessary to satisfy all buyers at the price announced.

[19] Cochrane, op. cit., p. 26.

This assumption facilitates the determination of the degree of substitution of the products of two firms. The ability of any firm to affect the sales of the others will be examined when their power relations relative to numbers and sizes are analyzed. Therefore, for purposes of this study, this assumption facilitates the separation of the substitution effect and the power effect due to numbers and size.

There are many market places in which farmer A may sell his apples: (1) to fresh buyers in the Appalachian Area, f.o.b., orchard; (2) to processor buyers, f.o.b., processing plant; and (3) through any one of many central wholesale markets, f.o.b., central market. Usually apples are sold on the basis of U. S. Grades and Standards, regardless of types of outlet (fresh or processor) or market place. Grades standardize apples: that is, they classify apples by variety, quality and size.

Assume that the f.o.b. Appalachian Area price for U. S. No. 1 Stayman 2½"-3" in diameter is $3. per bushel. Assume that farmer A cuts his price to $2.50. Will farmer A's cut in price affect the sales of other apple growers? The answer is yes. Other sellers of that grade, variety, and size will find it difficult if not impossible to make sales. Consequently buyers will shift to farmer A. The effect will be not only on one particular grade, variety, and size but also on the sales of other grades, varieties, and sizes. Under conditions of equilibrium, in any market place the prices of the different grades, varieties, and sizes have certain relationships to each other. Once this equilibrium relationship is broken by a change in the price of a particular grade, variety, and size the equilibrium is disturbed for the other grades, varieties, and sizes.

Wholesale apple buyers may be described as experts in that they usually insist on inspecting and comparing alternative offers before every purchase. Buyers are paid to exercise their expert judgment and ability to get the utmost out of every transaction.[20]

Since farmer A sells apples both in the Appalachian Area and in many of the central wholesale market places throughout the United States, it is immaterial in which market place he cuts price, Table 5. The same substitution effect results among sellers and among different varieties, grades, and sizes of apples. Similar expertness among buyers will be found in all market places. When farmer A sells in the various central wholesale market places, he is not only selling in competition with other Appalachian Area apple growers but with those from all major producing areas in the United States, Table 5. The substitution effect will be the same for sellers from other areas as for sellers from his own.

[20]For a fuller discussion as to the expertness of buyers in the wholesale markets see: Tibor Scitovsky, *Welfare and Competition, The Economics of a Fully Employed Economy*, Richard D. Irwin, Inc., 1951, p. 17.

Table 5. Carlot and Truck° Unloads of Apples in 21 Cities by States of Origin During 1954

City	Cal.	Ill.	Mass.	Mich.	N. J.	N. Y.	Ore.	Pa.	Vt.	Va.	Wash.	W. Va.	Colo.	Idaho	Others	Total
Atlanta	8	1		14		12	2	32		526	321	52	..	..	292	1,293
Baltimore			3		82	25	7	249		90	252	122	..	1	131	962
Boston	1				95	189	7	8	16	15	301	1	..	..	885	1,521
Chicago	21	60	17	788	37	63	31	33	5	62	1,773	45	2	14	221	3 202
Cincinnati	9	25	1	41	18	69	1	3		14	117	19	..	..	194	814
Cleveland		17	30	147		178	2	50	8	27	306	45	..	..	233	1,013
Dallas	12									5	584	..	..	23	77	701
Denver	33	1		1			2		..		281	..	149	27	186	680
Detroit		13		661	18		14	1	..	17	553	16	..	8	89	1,390
Fort Worth	6								..	2	107	..	..	9	89	213
Kansas City	9	28		86		1	14	3			374	2	47	33	128	725
Los Angeles	1,021						293		..		2,677	..	..	43	111	1,118
New Orleans	5			2		1	20	10		78	442	..	..	..	66	624
New York	11		256	1	606	3,286	10	163	538	78	1,695	6		5	294	6,982
Oakland	230						51				317			..	14	612
Philadelphia			33		556	291	8	131	10	117	720	91			80	2,376
Pittsburgh	1	20	31	1	15	285	1	191	5	19	101	212		1	209	1, 131
St. Louis	3	167		252		10	6	49		37	523	7	11	8	91	1,167
San Francisco	387						16				368			2	13	816
Seattle	15										161					179
Washington, D. C.			26	1	23	38		91		141	161	116			36	656
Total	1,781	332	427	2,028	1,450	4,451	551	1,317	582	1,288	13,046	737	209	174	3,712	32,115

° Truck unloads in carlot equivalents.

Source: Carlot Unloads of Certain Fruits and Vegetables in 100 U. S. and 3 Canadian Cities, also Truck Unloads in 20 U. S. Cities, 1954, U. S. Department of Agriculture, AMS, Fruit and Vegetable Div., Market News Branch, AMS-25, Washington, April 1955.

The prices of all grades, varieties, and sizes of apples are closely related and tend to move together due to the high degree of substitution. Also, different market places are tied together by apple sellers substituting one market place for another. For example, if farmer A can realize a higher f.o.b. orchard price for his apples by selling in Chicago than by selling in Atlanta, he will tend to substitute Chicago for Atlanta until returns are the same. In the same way he determines whether to sell to the fresh or processor outlets. Therefore, all farmers selling apples are selling substitute products (apples). Due also to the wide distribution of apples from each producing area, all farmers selling apples are in the same market group.

It is realized that certain producers may enjoy a premium for their apples due to variations in location and costs of transportation. Also, since one apple is not a perfect substitute for all other apples, there will be differentials for preference differences. However, the range of these differentials will be determined by transportation costs and preferences for one apple over another. Consequently, the price of any one variety, grade, and size, at any given location, will affect the price which may be received for the same product in another location and the price for other grades, size, and varieties of apples at the same or other locations.

INDUSTRY CONCEPT

For any two firms to be in the same market sub-group they must have similar structural patterns and must handle substitute products. It was found that similar structural patterns usually fall along industry and product lines, because firms producing the same product or very similar products are faced with quite similar problems throughout their operations. In the production of apples, technological, market, and organization problems which confront farmer A are similar to those confronting all other apple growers.

Although apples are produced over a large part of the United States, the bulk of the commercial crop is produced in about three or four major producing areas, Figure 3. The length of time necessary to establish a producing orchard is about the same in the different areas. The length of growing season and production costs present similar problems in the various areas. In some areas costs may be somewhat higher than in others due to irrigation, but in these areas yields will also be higher.

The weather presents many problems for apple growers. Frost, winter freeze, drought, and hail are some of the major problems. Cer-

tainly the probability of any one of these occurring varies among areas. However, there may be certain offsetting effects. For example, winter freeze seems to be a greater hazard in the Pacific Northwest, and frost in the spring is greater in the east. The amount of sunshine and temperature appears to affect the finish of the fruit. Some areas may be consistently favored in this respect. This would help to differentiate the fruit of these areas from the fruit of others.

It was found that the different producing areas sell through the same market place in many instances, Table 5. It also was found that some areas depend more on the processor outlet than do others. However, for any grower there appears to be a number of alternative market places available. The marketing problems confronting all apple producers are quite similar.

It is concluded that all apple growers are in the same industry and sell substitute products. This qualifies all such growers for the same market sub-group, as defined in this study. This grouping of firms was not arrived at by a precise statistical quantitative procedure because the necessary data were not available; and if they were, such an analysis would be an almost endless process because so many firms are involved.[21] Therefore, a decision to group all apple growers together must be subjective, based on the judgment of the researcher and on his knowledge of the performance and of the conditions confronting the firms under consideration. Before arriving at this decision the author discussed with many growers, marketing men, and horticulturists the behavior and problems confronting apple growers. He also relied upon first-hand knowledge of the situation in the Appalachian Area.

This decision was reached with full knowledge that all apples are not perfect substitutes for each other, and that all growers are not confronted with identical problems, even in the same county. However, apples produced by a particular farmer are a rather close substitute for those produced by other growers in the same area and in other areas. The major problems confronting apple growers relative to the production and marketing of their apples are also quite similar.

SELLERS OF PRODUCTS OTHER THAN APPLES

Only the effect of apple sellers on each other has been considered. What of their relationship with sellers of other products—such as other fruit? No doubt there is substitution between apples and other fruits.

[21] Professor Cochrane was particularly helpful to the author in developing this section. For a statement of the problem by Cochrane see: Cochrane, op. cit., p. 34.

Consequently, this gives an apple seller a positive sloping cross-demand curve with sellers of other fruits. However, the degree of substitution is weaker than that among apple sellers, thereby making a break or gap in the degree of substitution. The substitution effect of other fruits can be handled by the elasticity of the total demand for apples rather than by bringing other fruits into the market sub-group. Doing so would complicate the problem without aiding significantly in its solution.

The concept of an industry becomes important at this point. All apple growers have similar structural patterns in that their production and marketing problems are similar. However, conditions are more homogeneous among apple growers than between apple growers and other fruit growers. Rather than bringing other fruit growers into the same market group, their effect can be injected through the demand curve for apples. Therefore, only apple sellers will be included in their market sub-group.

POWER RELATIONS AMONG APPLE SELLERS

The substitution between farmer A's apples and any other grower's apples is relatively high. However, before A can affect the sales of any other grower by a cut in price, he must be able to supply the demand at the lower price. Up to this point it has been assumed that farmer A could supply the demand at the lower price. When this assumption is removed, and farmer A's ability to supply the demand is examined, it is found that he is unable to do so. Farmer A not only is one among many apple producers but for any particular variety he produces a quantity insufficient to influence price. In 1950 there were over 2,500 commercial apple producers in the Appalachian Area.[22] The 1950 Census of Agriculture reported over 1.5 million farms reporting the production of apples.[23] A conservative estimate is that there are over 100,000 commercial apple producers in the United States. Therefore each grower produces an insignificant proportion of the total supply, even for one variety.

The power relation among apple growers is atomistic. Each grower is a price taker. He may decide how much to produce and sell, but he must take price as given. Even though there are factors which deviate from the pure competition model, apple growers in the marketing of their apples act basically as though they were selling under conditions

[22]Cecil N. Smith, *Outlets Utilized by Cumberland-Shenandoah Growers in Marketing the 1950-51 Apple Crop*, Virginia Polytechnic Institute, Agricultural Experiment Station, Bulletin 461, June 1953.

[23]Census of Agriculture, 1950, Vol. II, General Report, Table IV, p. 680.

of pure competition; that is, (1) each seller is so small relative to the market sub-group that he exerts no perceptible influence on the price of apples; (2) entry is free and of no concern to those already producing and selling apples; and (3) knowledge is rather complete as to the alternatives available.[24]

All apple growers find themselves in the same market sub-group, selling similar products, and competitive pressure is strong due to the mass action of all sellers. No one seller can follow an independent pricing policy; each seller must take price as given. He is a price taker. No seller is able to exert competitive pressure on any buyer.

Apple Buyers

In the Appalachian Area apple sales are about equally divided between the fresh and processor outlets. Fresh buyers will be considered first.

BUYERS OF FRESH APPLES

In determining the group of buyers which represents the demand side of the sub-groups, criteria are the same as those for sellers, namely (1) any two firms must offer substitute outlets for the product, and (2) all firms must have similar structural patterns or belong to the same industry.

Substitutability

It already has been stated that apple growers (sellers) will substitute one buyer for another over a wide range of market places. An illustration may show how buyers in widely separated market places are substitute outlets. Assume that price is such that all market places for fresh apples are in equilibrium, and that no seller can switch from any one buyer to any other buyer in any market place and increase his f.o.b. orchard returns for apples. Assume that firm A (apple buyer) in any market place, for example, Atlanta, increases his price. Because there are no restrictions on the movement of apples between market places, except transportation costs, and because price already was adjusted for transportation before the price change by firm A, apple growers will tend to shift shipments from other firms and other market places to firm A. This will continue until either firm A lowers its price, or other firms in this and other market places raise their prices, or a combination

[24]George J. Stigler, *The Theory of Price*, Macmillan Co., 1950, p. 21

of both once again restores equilibrium.[25] Therefore all fresh buyers offer substitute outlets.

Industry Concept

Fresh buyers have similar structural patterns in that they handle the same product and perform the same function. Some fresh apple buyers may handle only apples, and others may handle many products. However, firms which handle many products are confronted with problems similar to those confronted by specialists, as far as their apple activities are concerned. Consequently all fresh buyers belong to the same industry.

Power Relation Among Buyers of Fresh Apples

Due to the large number of buyers, each buying a relatively small volume of the total, and due to the high degree of substitution among buyers, their relationship is atomistic. That is, any one firm cannot make an independent price change, for it either will lose all its suppliers if it lowers price or be flooded with supplies if it increases price.

There is possibly one exception—the produce-buying activities of A&P.[26] However, part of A&P's power and advantage is obtained through vertical integration. Therefore, it is difficult to ascertain the extent to which the power is obtained by buying apples at a price lower than other buyers pay. However, due to the large number of alternative buyers and to the thousands of sellers, the extent to which A&P is able to obtain apples at prices lower than competitors is probably minor. Later it will be pointed out that chain store buying policies may affect the sellers of apple products.

Competition among fresh buyers is similar to competition among apple sellers. Therefore the power relation is atomistic and each buyer is a price taker. Again the pure competition model best describes the situation, although there are deviations from this model.

PROCESSOR BUYERS

Processor buyers are important to apple sellers in the Appalachian Area. In recent years they have purchased approximately one-half of the crop in the area.

[25]Waite and Trelogan, op. cit., p. 157; "The price of a good at one place cannot exceed the price of the same product at another location by more than the cost of transfer between the two places, except when the difference in price is unknown, or temporarily before a transfer of the product can be made." Federal-State Market News Service for apples daily reports price in leading market places.

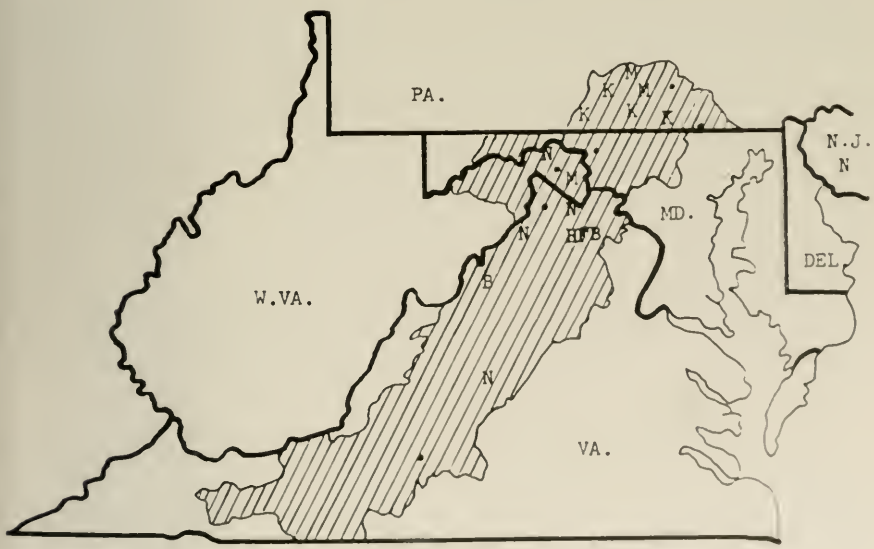
[26]Papandreou and Wheeler, op. cit., pp. 281-291.

Substitutability

Figure 8 gives the location of the plants of six processing firms in the Appalachian Area. All the major plants are located within a radius of approximately 75 miles of Martinsburg, West Virginia. These firms buy apples on the basis of U. S. Grades and Standards for processing. Therefore, it is relatively easy for growers to make comparisons of offers among the processors.

The cross-demand curve of any two firms will be positively inclined. In other words, all firms are substitute buyers for apples in the Appalachian Area and subject to similar forces of supply. The price that any one processor offers affects the quantity offered to any other processor in the area.

Are processors in the Appalachian Area and those in other areas subject to the same forces of supply? The answer probably is no. Processors have their facilities located in specific areas and depend on local producers for their supply of apples. The net cost of marketing processed apple products is less if the apples are processed in the production area. Consequently, apples are processed near the point of production in order to reduce their weight, bulk, and perishability.



LEGEND: M = Musselman; N = National; K = Knouse; S = Shenandoah; HFB = Byrd; B = Bowman.

FIGURE 8. Location of processing plants in the Appalachian Area.

At this point the problem is to determine the nature of the relationship between the price paid by different processors: for example, the effect of prices paid by processors in the Appalachian Area on the supply of apples available to processors in New York, the closest apple processing area. An illustration will best demonstrate that relationship.

Assume that prices are in equilibrium and that processors in the Appalachian Area are paying $0.80 per bushel for processor apples and receiving ten million bushels—that the average U. S. fresh price is $2. per bushel and buyers are receiving 80 million bushels. Also assume the elasticity of supply to processors in the Appalachian Area is unity and that the elasticity of demand for fresh prices is also unity.[27] Now assume that processor A in the Appalachian Area increases price 20 per cent to $0.96. Since all processors in the Appalachian Area are located relatively close together and buy on the basis of U. S. Grades and Standards, other processors in the area will have to increase their price immediately or lose virtually all their supplies. Apple sellers will now sell the processors 12 million bushels. The resultant increase of 2 million bushels means that fresh supplies are reduced by a like amount; 2 million bushels is 2.5 per cent of fresh sales. This means that fresh price will increase by 2.5 per cent to $2.05. Therefore, the fresh buyer will have a relatively minor adjustment, whereas the other processors in the same area will have a significant adjustment. The New York processor will be affected by only a 2.5 per cent increase in fresh price. This assumes that there is full and complete adjustment. In actual operation such a move by processor A might go relatively unnoticed by fresh buyers and processors in other areas due to the penumbra within which market prices fluctuate.[28]

Therefore, the price paid by processors in the Appalachian Area has little effect on the supply available to processors in New York. This statement may be broadened to include all processors outside the Appalachian Area, since other areas are more distant than New York.

Therefore, all processors do not meet one of the requirements for being in the same market sub-group. That is, the price paid by any one processor in the Appalachian Area does not significantly affect the supply offered processors in other areas.

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[27]The nature of the elasticity of supply and demand is considered in Chapter V. Indications are that the elasticity is greater than unity. However, it is assumed to be unity here to simplify the illustration. To the extent that it is greater than unity processors in one area will have less affect on those in another area than shown in the illustration.

[28]Waite and Trelogan, op. cit., p. 91.

SUBSTITUTABILITY BETWEEN FRESH AND PROCESSOR BUYERS

Does the price paid by apple processors in the Appalachian Area affect the supply of apples available to fresh buyers? The answer is yes. It will be demonstrated later that the quantity of apples received by processors is determined largely by the relationship of processor price to fresh price. The grower is interested in his net return for apples. Therefore he will take into consideration any differences in the cost of marketing in determining through which outlet to sell.

In the Appalachian Area, during the period 1934-54, the average gross return to growers for sales to processors was $0.80 per bushel and $1.93 per bushel for sales to fresh buyers. From a sample of growers taken in 1951 it was found that it cost growers from $0.96 to $1.28 per bushel more to sell to the fresh outlet than to the processor.[29] In the particular year, 1951, returns from sales to processors averaged $0.60 and from fresh sales $1.79. When fresh marketing costs are subtracted from fresh prices net returns vary from $0.51 to 0.82, making f.o.b. orchard returns about the same from both outlets.

This evidence verifies the point that fresh and processor buyers are substitutable in the case of apple sellers. Therefore, processor-buyers in the Appalachian Area and all fresh buyers are subject to the same forces of supply. However, the relationship is much closer among processors than between processors and fresh buyers. Processors depend on local supply and there are only a few local firms involved. On the other hand, fresh buyers draw their supply from several producing areas and many buyers are involved.

Industry Concept

Are all processors in the Appalachian Area confronted with similar problems? The answer is yes. The operations of all are similar. They buy from the same growers and sell to the same buyers. They produce similar if not "identical" products. Variation in size of operation and type of ownership has no appreciable effect on the type of problems confronting the various firms.

Are processors and fresh buyers confronted with similar problems and therefore do they belong to the same industry? The answer is no. Fresh buyers purchase for immediate sale without changing the apple's form, whereas processors buy in a few weeks the amount that they sell over a period of a year or more. They also change the form of the fruit. The cost of apples is only a part of their total cost. Containers, manu-

[29] Homer C. Evans and W. S. Hutson, *Marketing Appalachian Apples*, West Virginia University Agricultural Experiment Station Bulletin 372, March, 1955

facturing, storage, and other costs must be considered by processors. The power of the fresh buyer has been described as atomistic, but this may not be true for the processor buyer. Therefore, fresh and processor buyers are confronted with different problems and do not belong to the same industry as defined in this study.

POWER RELATIONS AMONG PROCESSORS

In the case of apple sellers and fresh apple buyers so many firms are involved that their relationship is atomistic. Consequently, there is no need to identify the numerous sellers and buyers because they cannot influence price individually. Therefore, the behavior of any one is of no concern to the others. This is not the case with processor buyers in the Appalachian Area. Consequently it will be necessary to identify the buyers and know something of their relative size, of their operations, and of their behavior.

CHARACTERISTICS OF PROCESSORS

In recent years six processors have accounted for the purchase of the bulk of the apples processed in the Appalachian Area.

The C. H. Musselman Company (Musselman), National Fruit Product Company (National), and Shenandoah Valley Apple Cider and Vinegar Corporation (Shenandoah) were in operation prior to 1934. Bowman Apple Products Company (Bowman) began operation in 1939; H. F. Byrd, Inc. (Byrd) in 1948; and Knouse Food Cooperative Inc. (Knouse) in 1949. Table 6 gives the relative volumes of purchases by these processing firms for certain years from 1934 to 1954. Data are not available for all years.

Table 6 shows that in recent years the processors listed have accounted for the purchase of most of the apples used in the area for processing, but in earlier years they accounted only for slightly over 50 per cent. The six processors listed are engaged principally in the production of sauce and slices, which in recent years have become more important relative to other products, Figure 6. Dried apples were much more important in the thirties. They were processed mainly by many small operators for whom no data are available.

Applesauce and slices are the principal apple products produced by these leading firms, but not all the apples can be used in this manner. According to Hunt of National it was found that it required from 142 to 168.9 pounds of number one canning apples to produce 100 pounds of apple slices.[30] Apples 2¾ inches in diameter and up required 142 pounds, and apples 2¼ inches in diameter required 168.9 pounds. The

[30]Unpublished report, 1949.

loss is composed of peel, core, seed-cell trimmings and defect trimmings. Although these trimmings are not usable for sauce and slices, they may be used for vinegar juice, cider, jelly, pectin, and pomace. In addition to the above by-products from U. S. No. 1 canning apples, some of the apples are not suitable for sauce and slices and must be used for other products. Therefore, even though these leading firms are engaged primarily in the production of sauce and slices, they must dispose of the by products, which accounts for part of their income. Table 7 gives (for Musselman) the percentage of total sales accounted for by sauce and slices and by all apple products.

TABLE 6. PERCENTAGE DISTRIBUTION OF PURCHASES AMONG VARIOUS PROCESSING FIRMS, APPALACHIAN AREA 1934-1954.

YEAR	MUSSELMAN	NATIONAL	SHENANDOAH	BOWMAN	BYRD	KNOUSE
1934	30.0	x	1.3	—	—	—
1935	19.6	x	3.6	—	—	—
1936	38.9	27.9	1 9	—	—	—
1937	24 6	24 9	4 5	—	—	—
1938	36 2	27.2	4 1	—	—	—
1939	25.6	22 9	3 7	2 9	—	—
1940	30 5	23 3	7 0	6.1	—	—
1941	19 9	14 6	5 6	1 3	—	—
1942	32 0	19 8	5 6	0 98	—	—
1943	25 9	x	5 6	5 1	—	—
1944	23.2	x	1 1	1 1	—	—
1945	27.6	x	6 5	1 9	—	—
1946	24 9	x	4 2	3 2	—	—
1947	28 8	x	3 1	4 1	—	—
1948	27.7	x	5 0	5 9	—	—
1949	25 2	28 0	3 3	1 1	6 0	18 8
1950	25.6	30 2	5 8	6 1	6 1	20 3
1951	32 7	x	1 0	3 6	x	11 7
1952	33 1	x	1 6	5 0	x	9 9
1953	x	x	x	x	x	11 9
1954	x	x	x	x	6 5	16 6

— = before firm started processing

x = data not available

Source: OPA and OPS records and apple processors, (OPA and OPS data pertaining to apple processors are filed with the General Services Administration, National Archives and Records Service, Washington, D. C. Future references will refer only to OPA and OPS records.)

TABLE 7. PERCENTAGE THAT SALES OF APPLE PRODUCTS WERE OF TOTAL SALES OF ALL PROCESSED PRODUCTS BY MUSSELMAN, 1937-43.

YEAR	SAUCE AND SLICES	ALL APPLE PRODUCTS
1937	52	99
1938	42	99
1939	54	98
1940	62	85
1943	61	84

Source: OPA records.

The increased volume of tomatoes and cherries largely account for the decline in the percentage sales of all apple products in 1940 and 1943. Musselman is the largest purchaser of apples for processing in the Area, averaging 28 per cent of all purchases, Table 6.

National purchases almost the same volume as Musselman, averaging 24.3 per cent of all apples purchased for processing, Table 6. In 1942 sauce and slices accounted for 33.9 per cent of National's total sales, and all apple products accounted for 97.4 per cent.[31]

Shenandoah averaged only 4.7 per cent of total volume and less than one-fifth the volume of the two larger firms, Table 6. Shenandoah produces primarily applesauce and slices. Shenandoah is a private corporation, but some of its operating policies make it unique. Arthur, of Shenandoah, testified before the FTC examiner that 75 to 80 per cent of all apples used by that firm were normally supplied by the owners of the corporation.[32] Many of the owners or members of their families work in the plant.[33] He also commented that it did not matter whether net earnings were distributed as a return on stock, as a bonus to apple suppliers, or in the form of higher wages and salaries, for the same people benefit in any case. (This would be true only if ownership, apples supplied, and wages were closely correlated for each individual concerned.)

Bowman started processing in 1939. From 1939 through 1952 Bowman's purchases averaged 3.4 per cent of all sales to the processor. Bowman purchased a higher percentage during the latter years. Bowman, like Musselman and National, is a private corporation.

Byrd entered the processing business in 1948. It is an integrated operation, owned by the largest apple grower in the area and it processes apples grown by the owner and by members of the immediate family. It is estimated that Byrd processes about 6 or 7 per cent of the apples in the area.[34]

Knouse started processing apples in 1949.[35] It is a cooperative corporation, supplied by approximately 400 apple growers throughout the Appalachian area. In 1949 and 1950 Knouse processed approximately one-fifth of all apples processed in the area, only slightly less than Musselman and National. However, in 1951 and 1952, it processed only 14.7 and 9.9 per cent of the total, respectively; but in 1953 and 1954

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[31] OPA records.
[32] FTC Docket, No. 6041, p. 1256.
[33] Ibid, p. 1299.
[34] *The New York Times*, Section 3, p. 1, November 6, 1955.
[35] See Appendix p. 98 for the historical background of Mr. Knouse and Knouse Foods Cooperative, Inc.

it processed 14.9 and 16.6 per cent, respectively, Table 6. In the case of Knouse, Bowman, and Byrd a higher proportion of their total sales are in the form of sauce and slices than in the case of the other three firms.

SUMMARY OF POWER RELATIONS AMONG PROCESSORS

Six processors buy most of the apples for processing in the Appalachian Area. The two largest buy approximately one-half; a cooperative takes about one-sixth; and the remaining one-third is taken mostly by three smaller firms. One of the three smaller firms operates very much like a cooperative, and a second one is integrated with the production operations of one of the largest apple producers.

The power relations among processors are different from those found among either apple producers or fresh apple buyers. It appears that Musselman and National have a circular power relation between each other and a dominant power relation with that of some of the smaller firms. While in some years Knouse had only a slightly smaller volume than Musselman and National, its operating policies differ.

In establishing price during the marketing season Knouse can make advance payments on apples and may set price goals as to what it hopes to pay growers. However, final settlement for the apples cannot be made until the season's operations are completed. The competitive pressure that Knouse brings on other firms may have a greater long-run than short-run effect. In other words, its operating policies may dampen the immediate effects of its competitive pressure. However, this dampening effect may be partly offset by Knouse setting price goals. Through past performances these goals may be considered as the equivalent to a firm price, thereby, in the short run, applying competitive pressure on other firms.

Some of the smaller processors possibly feel unable to affect the purchases of others by a change in their own price. Therefore, the power relation among the smaller processors is atomistic, whereas that between the smaller ones and larger ones is one of dominance by the larger firms.

It is easy for sellers to make a comparison of price between buyers, as purchases by all processors are made on the basis of U. S. Grades and Standards, and prices are usually announced in advance of delivery. Processors are located comparatively close together, and one is about as convenient an outlet as another. Usually processors buy from anyone desiring to sell at the announced price. Under those conditions the power relations are determined largely by relative size and capacity.

The excess capacity of some of the processors is comparatively high. There are only a relatively few firms in the sub-group. Apples may be stored rather easily before processing, and after processing they may be stored at low cost. Capacity may be increased by adding more shifts to existing plants. This point indicates a rather high degree of circularity. However, excess capacity in terms of circularity is a relative matter and may be of no importance to relatively small firms.

In summary, the power relations among apple processors functioning as buyers of apples are either circular or dominant. The relation between the larger firms is circular, and between the larger firms and smaller ones dominant. The relationship among the smaller firms may be atomistic. Only a few firms are involved and the nature of competitive behavior is determined by their decisions. It has been argued that if certain conditions are present a particular pattern of behavior may be found. The degree of substitution and the number of firms in the market have already been considered in arriving at the hypothesis that their power relationship is a combination of circularity and dominance. It is further argued that if the power relation is other than atomistic, the presence of a cooperative in the group and the ease of entry affect the nature of competition.

Cooperative

Knouse is a cooperative. Shenandoah's policies give it many of the characteristics of a cooperative. Byrd is an integrated operation, which makes its similar to a cooperative in some respects.

Entry of New Firms

Papandreou and Wheeler classify restrictions on entrance into five categories: "(1) terms on which technological data and technologies are made available; (2) terms on which factors of production are made available; (3) terms on which outlets for the product are made available; (4) consumer allegiances; (5) outright legal restriction."[36] In view of these restrictions entry should be relatively free in the apple processing business.

There appear to be no trade secrets in the apple processing business. Growers switch from one buyer to another for a slight premium in price. There are apparently no strong ties between growers and buyers. Consequently, factors of production are available on the same terms to new firms as to established firms; however, if established firms take aggressive action toward new firms, conditions will become less favorable for all firms. Established outlets and consumer allegiance may make conditions

[36]Papandreou and Wheeler, op. cit., p. 179.

slightly more favorable for existing firms. This advantage is reduced by the use of buyers' labels. There are no outright restrictions in entry. Consequently, entry is relatively easy.

Summary of Market Sub-Groups Found In the Appalachian Area

Firms are in the same market sub-group if they meet two requirements. First, the cross-demand (cross-sales) curve between any pair of firms must be generally-positively inclined. For buyers, the cross-supply (cross-purchase) curve between any pair of firms must be generally-downward sloping. Second, any pair of firms must have similar structural patterns or be in the same industry. Industry grouping usually falls along product lines, and all pertinent conditions confronting the firms in the industry are similar. Using these criteria for delineating sub-group boundries, the following groups involving apple processors in the Appalachian Area are found:

1. Apple growers (sellers) in the Appalachian Area are in sub-groups made up of all commercial apple producers in the United States. They are price takers, and their relationship among each other is best described as atomistic. The pure competition model best describes their behavior.

2. All fresh buyers in the United States are in the same market sub-group. They are also price takers, and the pure competition model best describes their behavior.

3. All processor-buyers in the Appalachian Area are in the same market sub-group. There are only a few buyers involved in this sub-group. They are price makers, and some form of imperfect competition best describes their behavior. A cooperative is present, and entry is relatively easy.

This completes the rather broad and general grouping of buying and selling market sub-groups for apples in the Appalachian Area. Again it should be emphasized that these groupings are based on what is known about the marketing of apples and upon personal judgment.

The only place in the marketing system where there appears to be a lack of competitive pressure is in the sub-group made up of processors buying apples. Consequently, the remainder of this study will be devoted to determining the extent to which there is competitive pressure in this sub-group and to determining the factors responsible either for competitive pressure or for the lack of competitive pressure.

Chapter V

DESCRIPTION OF OPERATING POLICIES AND CONDITIONS CONFRONTING PROCESSORS

IN order to analyze the competitive behavior of apple processors in the Appalachian Area, it is necessary to know something about the nature of the demand and supply relations confronting the group. This information will give some idea of the external conditions confronting the firms in the market sub-group.

Nature of Demand and Supply For Processors

NATURE OF DEMAND

The demand of processors for apples is derived from consumers' demand. In other words, it is the average revenue for apples, derived by deducting the average costs of processing and distribution from the average gross revenue from apple products.[37] Therefore, the elasticity of the demand of processors for apples is dependent upon the elasticity of consumers' demand for apple products and upon the nature of processing and distribution costs. If processing and distribution costs are constant, the demand for apples will be less elastic than consumers' demand for apple products.[38]

The total demand for food is rather inelastic. Also, the demand for some individual food items is elastic. Fox found that the demand for apples in the United States at the farm level has an income elasticity of 1.32 and a price elasticity of −1.27.[39] Price and quantity data necessary to calculate the elasticity of the demand for apple products are not available. However, certain generalizations relative to the nature of the demand may be made from what is known about the situation.

Throughout the FTC hearing concerning the apple processors in the Appalachian Area numerous references were made by processors to the many close substitutes for apple products. Apparently the consumer also

[37] Nicholls, op. cit., p. 74.
[38] Ibid., pp. 34-35.
[39] Karl A. Fox, *The Analysis of Demand for Farm Products*, United States Department of Agriculture, Tech. Bulletin 1081, 1953.

feels that there are many good substitutes for these products. Such a situation gives an elastic demand for apple products.

A high proportion of sliced apples is used in pies. The following quotation from Hunt points up the substitutability between fresh apples and canned apples: "We are competitive with the fresh market on our sliced apples and we had a considerable portion of our pack up and fruit committed for and if the trend continued as it was, the fresh market was likely to become further depressed, which would give us tremendous competition from the fresh market on our slices; that did happen. I know an account that we normally ship the equivalent of 30,000 bushels of apples to, in the form of slices, that we lost entirely because they were able to buy fresh apples in the fresh market cheaper."[40] Frequent references also were made to the alertness of pie bakers to changes in relative costs of different ingredients.

Hunt also made reference to the many substitutes for sauce, and to the point that sales were responsive to price changes. Apple products, like fresh apples, are substitutable for many other products. Fresh apples are also highly substitutable for apple products. This substitutability is due in part to the fact that fresh apples can be made into apple products. Therefore, it is logical to conclude that the elasticity of the derived demand for apple products is as great, or greater, than is the elasticity for fresh apples, estimated by Fox to be −1.27.

Federal quality standards are widely used by processors of apple products. This tends to standardize the products. Also, processors of apple products never have made wide use of their own labels or brands. In the Appalachian Area some processors sell more than 80 per cent of their canned products under the buyer's label. The Farm Credit Administration found, in a study of cooperative processors, than 68 per cent of the canned noncitrus fruits and juices were sold under the buyer's label.[41] Such policies make the product of one processor almost a "perfect" substitute for that of other processors. This makes the demand for the apple products of a particular area more elastic than for the nation as a whole.

Therefore, it is logical to conclude that the elasticity of demand for apple products confronting processors in the Appalachian Area is greater than that for the nation. The nature of the supply of apples available to processors in the Appalachian Area will be considered next.

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[40]FTC Docket No. 6041, p. 651.

[41]Anne L. Gessner and Edward C. Collins, *Marketing Canned Fruits and Vegetables Processed by Cooperatives, 1948-49*, Farm Credit Administration, U. S. Department of Agriculture, Washington, D. C., Miscellaneous Report 131, June, 1951.

NATURE OF SUPPLY

Processors in the Appalachian Area depend upon local producers for their supply of apples. The supply in the Appalachian Area at the beginning of any given marketing season is fixed, or the supply curve is perfectly inelastic at any price above the cost of marketing. However, this is not the relevant supply curve for processors. The supply of apples available to processors is determined largely by their price relative to fresh price.

It has been argued that the price for fresh apples is established for the nation as a whole under conditions characterizing pure competition. It also was argued in Chapter II that processors in the Appalachian Area may consider fresh price as given, in that processors could have very little effect on fresh price through their own action, within the range in which they normally operate. Starting with fresh price as given, the quantity of apples received by processors in the Appalachian Area is determined largely by the price of apples for processing relative to fresh price. A rough approximation of this relationship is presented in Figure 9. The solid line represents an index of the ratio of processor prices to fresh price in the Appalachian Area, and the broken line represents an index of processor purchases to fresh purchases. Both indices are expressed on the basis of 1934 as being 100. The two generally move together with sales tending to fluctuate more than price. This indicates that the supply curve confronting processors in the Appalachian Area is elastic. It also indicates that over the period 1934-54, sales tended to increase proportionally more than price. However, there is a need to examine the adequacy of these figures for showing the nature of the supply curve confronting processors.

The period from 1942 to 1947 was influenced by the war. Price controls were in effect during part of the time. Shortages of materials and government orders to be filled also influenced the quantity processed. The prices used in Figure 9 may not reflect accurately the prices growers consider in determining which outlet to use. For example, fresh price was the average for the season. However, during the first two months of the season growers determine how they will market the bulk of their crop. It is pointed out elsewhere in this study that growers switch sales from one processor to another for as little as five cents per hundred. It also is probable that they may switch from fresh to processor for a small amount because growers are interested in the net returns they receive for apples. There have been occasions when the processors have opened with a price low relative to the fresh price and therefore received few apples until they adjusted their price upward. On

other occasions the processor price has been high relative to fresh, and processors were "flooded" with apples. The 1950 season represented such a situation.

Figure 9 gives a rough approximation of relative price and sales. However, it may understate the elasticity of the supply confronting processors. During the time that growers determine how they will market their apples, the elasticity of supply available to processors should be rather elastic.

* Maryland data not included in 1954.

FIGURE 9. Indices of ratio of processor prices to fresh prices and of ratio of processor sales to fresh sales, Appalachian Area, 1934-54. (Source: Calculated from U. S. D. A. data.)

In summary, the bulk of the evidence points toward an elastic supply of apples and an elastic derived demand for apples confronting apple processors in the Appalachian Area. With this as a background an examination is made of the activities of processors in procuring apples.

Procurement Policies of Processors

The environment and firm characteristics found in the Appalachian Area as they affect the behavior of processors are briefly reviewed. There are approximately 2,500 commercial apple producers in the area. In recent years they have produced about one-fifth of the national crop and have divided their sales about equally between processors and fresh buyers. The relative price offered by the two outlets largely determines the division of sales. Thus the supply available to processors is elastic, assuming that fresh price is given.

PRICE POLICIES

One firm announces an opening price, and all others follow with the same price. In 1947 National announced its price September 16, and Musselman followed September 17.[42] In 1948 Musselman announced its price September 9, and National followed September 10.[43] On October 11 National increased its price, and Musselman followed October 12.[44] In 1949 Musselman announced its price August 29, and National followed August 30.[45] Musselman announced its opening price August 28 in 1950; National's price list carried the same date.[46] These are typical examples of opening price announcements by Musselman and National.

Shenandoah and Bowman follow the price announcements of Musselman and National with similar if not identical prices. Byrd is an integrated operation and does not announce a price. Knouse, being a cooperative, follows a slightly different pattern. After the other processors have announced their prices, Knouse usually announces that it will make an advance to growers at the time they deliver their fruit. This advance usually is 50 per cent of a price normally identical to the price offered by other processors. As soon as the fruit is processed, Knouse credits its patrons with another 30 per cent. At the end of each annual pool, Knouse, on a patronage basis, distributes to patrons all receipts in excess of costs. Receipts usually have been large enough to make the total payment for apples more than the opening price of the

[42]FTC Docket No. 6041, Exhibits 116-A and 118.
[43]Appalachian Apple Service, Inc., Bulletin 210, Martinsburg, W. Va., September 10, 1948.
[44]FTC Docket No. 6041, Exhibits 112 and 113.
[45]Ibid, Exhibit 391.
[46]Ibid, Exhibits 60 and 61.

other processors. All of these payments may not be in cash, but part may be in some form of book credit and retained by the cooperative for a time on a revolving fund basis.[47]

This gives a general idea of the pattern followed in establishing a price at the beginning of a processing season. However, it does not necessarily tell the price at which apples are traded. Houser of Musselman made the following statement: "The price announcement that comes out in the early part of the season is not necessarily the price we pay for apples. I think in most cases they are called opening prices, and so stated in the price list on price announcements. There are many variables that come into the picture in the buying of apples."[48]

The price announcement by Musselman, previously referred to, dated October 12, 1948, was the announcement of an increase in price above the price list issued September 9. The latter announcement carried the following statement. "Because many of the growers, large and small, have delivered their apples to our plants before this change in price, we will make these prices retroactive to the beginning of the season."[49]

Since the entry of the cooperative (Knouse) in 1949, the payment of patronage refunds by Knouse, and of bonuses by the other processors, have become a general practice. Apparently the price is broad enough to satisfy tax officials that a prior commitment for such payments was made, and that they may be excluded from the incomes of the firms concerned. The general interpretation among apple growers and processors is that the announced price is a minimum price, and that it may be increased.

Trial Examiner Hier made an excellent summary of the situation in his initial decision of FTC Docket No. 6041:

> "If bonuses, allowances for freight, hauling, crates, storage, payments for culls and special 'deals' are all disregarded, the testimony is abundant and uniform that apples were bought by all processors at identical prices for the same size and grade (Tr. 1043, 1046, 1082-83, 1247, 1292-93, 1357-64, 1403, 1411-12, 1438, 1461, 1534, 1185-87, 1197). The uncontradicted and credible testimony is that the grower regards his orchard net as what he received for his apples. (Tr. 1935, 804, 209-10), and that even 5¢ a cwt. has enough economic significance to switch business (Tr. 1514, 843-44, 195-96, 1691-92, 534-35, 594-95). The testimony is that the announced price is 'just something the grower goes behind and makes his deal each time' (Tr. 1507-08), and is a base price, but not the price secured (Tr. 1216-38). There was competition in buying and in selling."[50]

The announced price may or may not represent the final settlement between growers and processors. Why all these special deals? Why not use a straight forward change in price, as under perfect competition?

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[47]Taken from the testimony of Mr. Knouse before the FTC hearing. FTC Docket No. 6041, pp. 1742 to 1869.
[48]FTC Docket No. 6041, pp. 1704.
[49]Ibid, Exhibit 113.
[50]FTC Docket No. 6041, *Initial Decision*, p. 24.

The fact that there is not perfect competition is probably the reason. Each firm is attempting to differentiate its offer from the offers of others. Also, price is often quite powerful and effective. Papandreou and Wheeler have this to say on the subject:

> . . . "Price is the 'atomic weapon' of business. The news of a price cut spreads fast, and its effects, in general, can be estimated adequately. All the things that go into making a promotional campaign, in contrast to a price cut, have to do with molding people's tastes and attitudes. No one knows beforehand the extent to which a new slogan will affect the public. Months of hard work may go to waste, whereas a flashy slogan picked out of the blue may produce spectacular results. Price cuts may often lead to all-out war, to conflict for survival. If firms are not inclined to engage in all-out war, they will avoid tampering with price except in a more or less guarded fashion. Higher levels of selling outlays and new ways of employing them in contrast, need not bring about a 'do or die' struggle."[3]

Chamberlin has the following to say:

> "Because most prices involve monopoly elements, it is monopolistic competition that most people think of in connection with the simple word 'competition.' In fact, it may almost be said that under pure competition the buyers and sellers do not really compete in the sense in which the word is currently used. One never hears of 'competition' in connection with the great markets, and the phrases 'price cutting,' 'underselling,' 'unfair competition,' 'meeting competition,' 'securing a market,' etc., are unknown. No wonder the principles of such a market seem so unreal when applied to the 'business' world where these terms have meaning. They are based on the supposition that each seller accepts the market price and can dispose of his entire supply without materially affecting it. Thus there is no problem of choosing a price policy, no problem of adapting the product more exactly to the buyers' (real or fancied) wants, no problem of advertising in order to change their wants. The theory of pure competition could hardly be expected to fit facts so far different from its assumptions."[4]

These two quotations indicate the importance of implicit price policies under conditions of imperfect competition. The fact that processors employ such practices supports the contention that there is imperfect competition among processors. Also, the absence of such policies among apple sellers and fresh buyers support the hypothesis that the pure competition model best describes their behavior. An examination of some of the implicit price activities of processors is made next.

IMPLICIT PRICE POLICIES

Clodius and associates found that dairy processing firms in Wisconsin used various nonprice devices in competing for producers' milk.[5] They had this to say about the effectiveness of such practices:

> "As stated earlier a large majority of the firms in this area favor and emphasize nonprice methods of competition. This follows directly from the belief that there is something inherently dangerous about price competition

[3] Papandreou and Wheeler, op. cit., p. 154.
[4] Chamberlin, op. cit., p. 10.
[5] Robert L. Clodius, Darrell F. Fienup, and R. Larry Kristjanson, *Procurement Policies and Practices of a Selected Group of Dairy Processing Firms*, University of Wisconsin, Research Bulletin 193, January, 1956.

because of the repercussions which may occur as other firms retaliate. This emphasis on nonprice factors is also consistent with the fact that most firms stated that they seek to follow a price policy of paying average prices unless some unusual and individual price opportunity exists. The value of nonprice methods as a competitive device is enhanced where price differences are minimized. Also nonprice practices are generally considered effective only 'if the price is there' initially. Keeping individual firms' prices close to the average is a way of insuring that the 'price is there.' "[54]

The situation among apple processors in some respects is similar to that found among dairy processing firms. For example, apple processors tend to announce identical prices for apples and they make extensive use of various forms of implicit price devices to attract fruit to a particular firm. It was found, as Clodius and associates learned, that these practices are effective. Once a practice is used by a particular firm it soon is employed by all firms. For example, 1949 was the first year of operation of Knouse. For that year's operation Knouse paid growers the prices paid by other processors and made a patronage refund in addition.[55] Shenandoah, National, Bowman, and Musselman paid their suppliers a bonus.[56] Since then such payments have become general practice. The same pattern applies to other practices employed by processors, such as allowances for hauling, either supplying the grower with crates or paying him for the use of his own, and payments for storage.

When are these practices employed? They are employed when any processor is not getting all the apples he could use at the price being offered. Often they start as "secret deals" between individual growers and processors, but they fail to remain secret and soon become the general practice of all. If the announced price is very far out of line, it is adjusted. The implicit price devices are employed for minor price adjustments and as an effort on the part of individual processors to differentiate their offers.

LONG-RUN VIEW

Processors seem to consider the long-run effect when they determine procurement policies. This long-run view is illustrated by the concern of processors over the long-run supply of apples, the entry of new firms, or changes in relative volume of existing firms. It already has been noted that the trend in the production of apples in the Appalachian Area is downward and the purchases by processors is upward. Such a situation eventually could make it difficult for processors to obtain supplies in the area. Such a situation could create pressure toward a relatively high price being paid by processors.

[54] Ibid, p. 29.
[55] FTC Docket No. 6041, p. 1864.
[56] Ibid, Exhibits 121, 122 and 123, and pp. 1263, 1712.

In 1950 the price level paid by the processors was relatively high contrasted to that of apples for fresh use. Consequently, movement to the processors was heavy, relative to movement into the fresh outlet. Bowman testified before the FTC hearing relative to his ability to buy apples cheaper than he was paying and to take more apples than he originally planned to buy.

Mr. Miller. "How much did you wind up with?"
Mr. Bowman. "Approximately one million . . ."
Mr. Miller. "Could you have bought apples cheaper?"
Mr. Bowman. "I could have bought apples for one-half of what I was paying."[57]

Mr. Bowman's reason for taking more apples than originally planned was ". . . we felt an obligation to our growers in our community that had been furnishing us apples for years."[58] The same year Hunt of National explained the situation as follows: "There was a large apple crop in 1950; the fresh market was not good, collapsed, and as a consequence, more fruit flowed to the processing plants than had in 1949 and previous years."[59] Rather than cut price, National borrowed 2 million dollars and continued to take fruit at a relatively high price.[60] Hunt also indicated that the reason for so doing was to take care of their regular suppliers.

In 1950 several factors affected the behavior of the processing firms. Due to the Korean situation it appeared that the demand for canned apple products might be unusually strong. Also, this was the second year of operation of the Knouse cooperative. In 1949 it had purchased 18.8 per cent of the apples for processing in the area and was expanding in 1950. This also was the third year of operation for Byrd. Consequently, there was a mixed feeling among processors whether to hold the price or cut it. Because new firms had entered the sub-group, all processors were reluctant to cut prices. They felt that it might affect adversely their relationship with the apple growers. They already were losing suppliers to Knouse and felt that a price cut might cause further losses. Also, there was the feeling that a high price might discourage the newcomers. Consequently, all processors continued to hold the price and pack the largest pack in history.

Processors tend to place much emphasis on the good will of the growers, and it seems that, in a competitive situation such as is found

[57] FTC Docket No. 6041, p. 536.
[58] Ibid, p. 539.
[59] Ibid, p. 621.
[60] Ibid, p. 634.

in the Appalachian Area, good will is one way of attracting fruit to a given plant. Therefore, it is important to maintain good relations with growers. Hauser emphasizes this in the following statement:

> "We spend a good bit of money on a program we would like to call growers good will. Naturally we would like to have our growers friendly with us and over a period of years we have had meetings, dinners, educational meetings with county agents and state college people, state horticultural societies and what not, where we have tried to show our friendliness to the grower. When a year comes around when the price is going to be lower than the previous year it is not a pleasant thing to announce, therefore, I would like my competitor to announce and I would date my prices so that the competitor had his price out first. When the price is on the high side, I would like to have my price out first.[61]

> "I might add that we are vitally concerned and I dare say most of the processors would be concerned as to the retention of orchards and the keeping of growers interested in growing apples, because we have tremendous investments in our plants and we must have apples for years to come and we cannot afford to let the growers get disgusted and go out of business because of not making money."[62]

It seems that the same philosophy carries over to cutting prices once a price has been established.

The evidence is quite strong that the processors, particularly Musselman and National, take a rather long-range view of the situation in attempting to get maximum returns.

The implication of this section is not that Musselman and National have more freedom to increase price than to lower it, but rather that the consequences are such that it may be more advantageous to raise price than lower it. However, they have the same freedom to lower price as to raise it.

A Processor's Analysis of the Situation

In completing this section of the study certain excerpts from a report by Hunt of National are presented. These statements represent how a particular processor responds to, or puts into operation, some of the factors discussed in this study. It should be kept in mind that Hunt made this report to a group of apple growers and was, quite naturally, interested in presenting a favorable picture for his firm. In 1954 processors announced their opening price about August 25 at $5. per cwt. for the best grade. About September 13 this price was reduced to $4.50, and about October 15 it was reduced to $2.50.[63] Hunt's account of this situation follows:

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[61]Ibid, p. 1707.
[62]Ibid, p. 1722.
[63]H. S. Stiles, *Marketing Appalachian Apples, Summary of 1954 Season*, United States Department of Agriculture, Agricultural Marketing Service, Martinsburg, West Virginia.

"I think that 1954 will go down in the memory of the major processors of this area as the Season they tried to hold an umbrella over the Apple Deal in the Appalachian Area, only to have it spring torrential leaks on them.

"The fact that National Fruit led off with the first prices in this area probably accounts for my being asked to come here today and try to explain the past season and tell you what happened from the viewpoint of the processor.

"When we announced our prices on August 18th, we knew very well that we were paying more for apples than we needed to, and were probably paying more than the law of supply and demand would justify. Subsequent events have proved this to be true. Now let me attempt to explain to you the reasons for our doing what we did.

"In the first place, we had just concluded a good season and were in an optimistic frame of mind.

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"Secondly, processed apple products had been moving satisfactorily at high prices, for example, we were getting $1.85 a dozen for No. 303 Apple Sauce.

° ° ° ° °

"In announcing the raw fruit prices, we said, and I quote, "Whether or not we can maintain these prices will depend upon both the processed and fresh fruit markets.

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"A third reason for these prices was that the higher fruit prices and lower profit margin would tend to discourage some of the opportunist 'cut-price' processors. There are some processors in New York and also in this area who expand their packs far beyond their normal sales when they can buy fruit very cheaply or sell quickly at cut prices. Their operations almost inevitably have a depressing influence on the market, first, by increasing the supply beyond the demand, and then secondly, by price cutting when they are not able to move their excess pack quickly. Making it less profitable for these operators would tend to stabilize the market for both the grower and the consistently operating processor.

"A fourth reason for these high prices was that our 1954 program called for twice as many Yorks as we were able to get in 1953. The 1953 crop of Yorks was about 1/2 of the '52 Crop and '52 was an "ON" year for Yorks. So, even though we realized the '54 crop was larger than '53, we felt we would be justified in paying a good price for Yorks.

"The next thing that we had in mind in making the prices as high as we did was to do away with the hauling allowances that had come into the deal during the previous season.

"We can't get any more for a can of sauce processed from apples that are hauled fifty miles than we get for one made from apples hauled five miles. If we pay more for the apples hauled the fifty miles then we have to pay less for the apples hauled the five miles in order to average out our costs.

"Every time you average out your costs, whether it be according to the distance hauled, grade or size of the fruit, you take money away from the grower who has the shorter haul, or better or larger fruit and give it to the grower who has the longer haul, or poorer or smaller fruit. This is not good business on the part of the processor and is not fair to the grower who has the shorter haul, better or larger fruit. There were some indications that hauling allowances might be in the price structure in 1954. Therefore, rather than have a price of $4.50 or $4.75 with hauling allowances of 10¢, 20¢, 25¢ or more per hundred, we decided to wrap all of our price up in one package and come out with one flat price.

"The last, and one of the most important reasons for the high prices was to encourage the planting and re-planting of more processing varieties, especially Yorks.

"We feel that the very best way to sell your crop is to move only your very best quality and highest colored fruit to the fresh market and that the processing channel will be your best outlet of the future for the balance of your fruit. However, the quantity of this kind of fruit that can be processed will depend upon the quantity of Yorks that are available for blending purposes. It is, therefore, important to you and us that a proper balance be maintained between Yorks and the Dessert varieties. We desired to encourage you to maintain this balance.

"That pretty well covers the reasons for what we did. Now, why didn't things work out satisfactorily?

"One reason that the beginning prices didn't hold was that the crop turned out larger than estimated nationally and in the major processing areas of Appalachia and New York.

"The first guesstimate of the crop, which was made by the leading growers in the various areas, placed the National crop at 97,450,000 bushels, Appalachian at 20,240,000, and New York State at 14,370,000 bushels.

"By August, when our decision was made, the various estimates varied from 101 to 102 million Nationally, 20,400,000 to 22,000,000 for Appalachia and 15,000,000 or more in New York State.

"The first estimate of the York Crop was 4,850,000 bushels, this compared to a crop of 2,682,000 in 1953, 5,353,000 in 1952 and a ten year average of 5,198,000 bushels.

"You all know what happened. The National crop turned out to be 103,773,000 bushels, Appalachia 23,225,000 bushels, and New York State 15,485,000 and the York Imperial Crop ran to approximately 6,000,000 bushels. This was less than 2% more than was estimated Nationally, approximated 6% more than was figured for Appalachia and about 7% more for New York.

"Another reason we couldn't hold our opening prices was that the New York State processors started buying apples at considerably less than our prices. Some of them were paying less for 2¾" Up apples than we were for 2½" Up. We were forced to adjust our prices to endeavor to meet the situation.

"About two weeks later one of the more recent packers of Apple Sauce in this area reduced their price for fruit about 10% under that being paid by the major processors. This cut, though, was not followed by the major processors at that time.

"From the very beginning of the season there were certain processors in New York State and this area who were underselling by 3% to 5%. During the first part of the season, the major packers of Apple Sauce held their prices firm and refused to meet these reduced prices.

"However, when one of the newer packers of Apple Sauce in this area used their 10% price reduction in fruit to still further reduce the price of the finished product and this further reduction was met by a larger processor, who was processing his own fruit, it was necessary for the major packers to adjust the price of their finished product downward to meet competition, or else they would lose customers of many years standing. I am quite certain that if any grower in this room faced the loss of a customer he had had for many years he would do the same thing to retain the customer's business.

"The smart buyers began to take advantage of this, withholding business from the major packers with established brands and began to play these weak

sellers in New York against those in this area. Some of these shrewd buyers cut off buying from this area, leading the processors down here to believe they were buying cheaper in New York State. Some of the cut-price sellers in this area, who were either buying apples at less than the major processors, or were processing their own fruit, reduced their prices even further under this pressure. Thus, they began a see-saw price reduction battle with the opportunist packers in New York State.

"While the consumer was apparently willing to buy Apple Sauce on the basis of $1.85 or $1.70 per dozen for No. 303 cans, the most popular consumer size, the chains were apparently unwilling to buy apple sauce on this basis for fear that some competing chain might buy cheaper and undersell them. This price cutting, which was started by weak sellers, not only justified the buyers in this stand, but also made them afraid and hesitant to promote Apple Sauce. Promotions have to be planned a week or two weeks ahead. The people who merchandise and promote Apple Sauce would naturally be reluctant to feature and plan a promotion on sauce when they were afraid that a competitor might have a cheaper price than they would have in a week or two weeks. We, therefore, did not get the same promotion of Apple Sauce this fall that we did a year ago, with the result that our movement of sauce was not as great this fall as it was a year ago.

"While the price of good fresh fruit held up good all during the harvest season, the price of poorer fruit did not hold up as well on the fresh market. By the time the winter varieties began to be harvested, the movement of the fruit into the fresh market bogged down and pressure began to be put upon the processing outlet to handle more fruit.

"This made a record-breaking pack of Apple Sauce a very good prospect and was another factor contributing to the general chaotic condition of the sauce market. This has turned out to be an actuality. It is now estimated that the pack of sauce will go over 15¼ million cases.

"After the price-war had gone on for several weeks and it became very evident that the pack of apple sauce would reach a record size, the major packers in this area, who had been holding firm on both the price of raw fruit and the processed product, were compelled to reduce the price of fruit drastically in an endeavor to average out their costs so as to meet these cut prices on apple sauce.

"The price of apple sauce thus tumbled from an opening of $1.70 to a low of $1.25 for the most popular size.

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"While the large overpack of sauce and the low prices this year are hurting at the moment, and may have a depressing effect next year, the long range result will be good.

"The large supply and low prices in the past have always increased consumption and it will do it again.

"The problem is going to be to keep the new users supplied in the future, so as to retain them as customers. Your part in solving this problem is going to be to keep the processing varieties, and especially the York, in balance with your dessert varieties. If we can't keep the present and new users of apple products supplied, then they will buy some other canned fruit, and we will lose a customer."[91]

Hunt's analysis of the situation tends to show the relationship of some of the forces involving processors. First, it emphasizes the fact that growers consider fresh and processor buyers as highly substitutable.

[91]Wilkie W. Hunt, *The Past Season and A Look Ahead*. West Virginia Horticultural Society Martinsburg, West Virginia, Vol. 25, No. 205, February, 1955. *The Mountain Grower*

Second, it emphasizes the high degree that one processor may be substitutable for another, both as a buyer of apples and seller of apple products. The inference is that a relatively small processor precipitated the drop in price of both apples and sauce. The substitutability of apple products also is high between the Appalachian Area and New York. Appalachian Area processors are concerned about the price of apples paid by processors in New York, not because it affects the supply available to them but because of its effect on the price which New York processors might attempt to obtain for their apple products. The inference is that if New York processors can obtain apples "cheaply," they might be inclined to put up a large pack and sell at a lower price than if they had paid more for their apples. By so doing they would apply pressure on Appalachian Area processors to sell at a lower price.

Some Characteristics of Knouse

Some of Knouse's characteristics have already been discussed. However, to give a complete picture of the nature of the cooperative, more information is needed. Knouse has about 400 members. These members are mostly the leading apple producers in the Appalachian Area. This appears to be significant. In some cases cooperatives seem to be composed of marginal producers who look to their cooperative for help in solving their problems. In such cases the cooperative often fails because it is asked to do the improbable. Such is not the case with Knouse. Most of its members also sell apples to processors other than Knouse. Most of them also sell apples to the fresh outlet. One of the directors of Knouse stated to the author that the cooperative encourages its members to sell to other processors, particularly when it is felt that the other processors are paying prices higher than economic conditions justify, or when members have apples of a quality or size that Knouse does not particularly need—provided that other processors return as much as the cooperative. However, Knouse wants to be able to take the growers' apples if other outlets are not returning as much as the cooperative. Such an attitude as this on the part of the membership and management of a cooperative goes far toward putting into practice what was theoretically presented in Chapter II. The leading apple producers in the area are using the cooperative as a device for measuring the efficiency of other processors. Such a policy also puts pressure on the cooperative for efficient operation. The membership of the cooperative is attempting to support it by providing it with a large volume of apples. Table 8 gives Knouse's volume as a percentage of total volume in the Appalachian Area.

Table 8. Knouse's Volume As a Percentage of Total Volume in the Appalachian Area, 1949-55.

Year	Apples Processed	Sauce Packed	Slices Packed
1949	18.8	12.1	40.4
1950	20.3	15.0	29.6
1951	14.7	13.2	24.4
1952	9.9	9.3	20.4
1953	14.9	14.3	22.9
1954	16.6	16.2	25.8
1955	20.8x	22.8	22.6

x = estimated.
Source: Knouse Food Cooperative, Inc.

The nature of a firm's cost curves would determine the effect of size on total cost. This in turn would tell the importance of relative size on the ability of one firm to apply competitive pressure on another. With this in view an examination of processors' costs will be made.

Nature of Processor Costs

The nature of cost and of relative costs among firms has important impilcations on the behavior of the firms in a sub-group. If overhead cost is relatively small, and there is little advantage to large-scale firms, entry of new firms may be easier, and there is less tendency for production to be concentrated in the hands of a few firms. If some firms are more efficient than others, the more efficient ones are in a position to bring strong pressure on the less efficient ones. Likewise the less efficient firms lack such power.

From the limited information available, the nature of cost and the relative cost among firms will be examined. The OPA made a cost study of some of the apple processors in the Appalachian Area.[65] Table 9 gives costs of packing applesauce by three firms.

The total costs of packing a dozen #303 cans of applesauce in 1941 were 65 and 67 cents for Musselman and National respectively. It cost Shenandoah 32.8 per cent more than National, or 89 cents to pack a dozen. Musselman and National buy approximately the same volume of apples. However, Musselman produces considerably more sauce than National. Shenandoah is approximately one-fifth the size of either of the other two. Although Musselman and National had approximately the same total cost for packing one dozen #303 cans of sauce, there was some variation in individual cost items.

[65]All the data used in this section on costs are taken from the records of OPA and OPS unless otherwise noted.

Table 9. Cost of Packing Applesauce by Three Firms in the Appalachian Area in 1941.

Item	Size of Can					
	#303			#2		
	Musselman	National	Shenandoah	Musselman	National	Shenandoah
	(Dollars Per Dozen Cans)					
Raw material	.15	.18	.25	.18	.21	.30
Sugar and condiments	.05	.05	.05	.06	.06	.06
Containers	.21	.21	.28	.24	.24	.23
Direct Labor	.07	.06	.13	.08	.06	.14
Indirect manufacturing	.05	.07	.09	.05	.08	.10
Labels	.02	.02	.02	.02	.01	.02
Cases	.02	.02	.02	.03	.02	.03
Other warehouse expense	.03	.02	.01	.01	.01	.01
Selling expenses	.03	.02	.02	.03	.03	.02
General and administrative	.02	.02	.02	.02	.03	.02
Total cost	.65	.67	.89	.72	.75	.93
Total cost excluding labor and raw material	.43	.43	.51	.46	.48	.49

Source: OPA records.

National paid more for apples but less for labor. This was also true for other size cans of sauce, as well as for apple slices. National consistently has maintained that it can pay a premium for larger apples and offset the extra cost per pound by less labor costs in processing. This tends to verify their contention. Also, according to the Federal-State Grading Standards, there are about 15 different classifications for processing apples, depending on variety, size, and quality. Different prices are paid for the different classification. Since apples from several classifications go into the production of a single product, it is possible for raw material costs to vary even though the same price is paid for each classification. This is true because different firms use different proportions of the various classifications in producing any one product.

Shenandoah had a somewhat higher cost than either National or Musselman. The higher cost was explained largely by higher labor and raw material (apples) costs. It was previously pointed out that Shenandoah is an integrated operation, owned and operated by the apple producers who supply most of the apples processed. Since the same people were involved in all cases, Shenandoah has followed a policy of returning net earnings to apple growers and employees, as well as dividends on stock. This practice may account for the higher cost of labor and apples. In comparing Shenandoah with the other two firms, in order to eliminate the effect of such a policy, direct labor and raw material costs were taken from total cost. This gave a cost of 43, 43, and 51 cents per dozen for Musselman, National, and Shenandoah respectively. Shenandoah paid 7 cents per dozen more for containers than did the other two. This particular case appears to be an exception in that in the same year they paid for #2 cans 1 cent per dozen less than did the other two firms. In 1941 they paid the same for #10 cans as the other firms. In 1943 all three firms paid identical prices for #303, #2 and #10 cans, the most popular size. If adjustment is made for the 7 cents extra paid by Shenandoah, and raw material and direct labor costs are excluded, Shenandoah's costs are 44 cents per dozen, compared with 43 for both Musselman and National.

Table 9 gives costs of packing #2 cans of applesauce for the same firms. The results are quite similar except that Shenandoah pays 1 cent per dozen less for containers than Musselman or National. Again, excluding labor and raw material costs, the costs for packing one dozen #2 cans of applesauce were 46, 48, and 49 cents for Musselman, National and Shenandoah respectively.

Table 10 gives the cost of packing apple slices for Musselman and National. Again costs are similar for the two firms. In standard pack

Table 10. Cost of Packing One Dozen #10 Cans of Sliced Apples by Two Firms in the Appalachian Area, 1941.

Item	(Standard)		(Fancy)	
	National	Musselman	National	Musselman
		(Dollars Per Dozen Cans)		
Raw material	1.68	1.61	1.79	1.66
Sugar and condiments		.01	.13	.01
Containers	.71	.69	.71	.69
Direct labor	.47	.56	.50	.60
Indirect manufacturing	.39	.37	.41	.40
Labels	.02	.03	.02	.03
Cases	.15	.15	.15	.15
Other warehouse expenses	.10	.04	.10	.04
Selling expense	.10	.19	.12	.21
General and administrative	.12	.14	.13	.15
Total cost	3.75	3.79	4.06	3.94

Source: OPA records.

there is a difference of only 4 cents per dozen, but in the case of the fancy pack there is a difference of 12 cents per dozen. However, in this instance National spent 12 cents per dozen cans on more sugar and condiments than did Musselman. However, when adjustments are made for differences in costs of sugar and condiments, adjusted costs are the same.

The OPS made a study of certain cost items for sauce and slices in New York and the Appalachian Area for the 1948 season. The Appalachian Area produces approximately one-half the nation's production of sauce and slices, and New York produces slightly less than one-third. (Tables 3 and 4). In the Appalachian Area six processors produce the bulk of the sauce and slices, and two produce about 50 per cent of the production in the area. In New York the situation is quite different.

In 1947 there were 55 firms in New York processing apples. However, 22 were handling over 77 per cent of all apples processed, and 18 of the 22 processed only apples.[66] From 1946 to 1948 the two largest New York processors produced 13.3 per cent of the national production of applesauce and 16.3 per cent of national production was produced by other firms. Indications are that there were several rather small processors in New York.

Table 11 gives the cost of certain major variable cost items in the production of sauce and slices in the Appalachian Area and New York.

[66]Bennett A. Dominick, Jr., *The Fruit and Vegetable Processing Industry in New York State.* 11 U. Agricultural Experiment Station, Ithaca, New York, A. E. 714, November. 1949.

Table 11. Average Cost of Certain Items in Packing Applesauce and Slices in the Appalachian Area and New York, 1948.

Items	Applesauce		Sliced Apples	
	Appalachian Area	New York Area	Appalachian Area	New York Area
		(Dollars Per	Dozen Cans)	
Raw material	.32	.39	79	71
Direct manufacturing labor	24	.26	.56	47
Containers	.61	.59	.47	48
Cases	09	.09	.12	.10
Labels	.06	07	.02	.01
Warehouse labor	.06	.08	.05	.09
Total	1.38	1.48	2 01	1 86

Source: OPS records.

In producing sauce New York has slightly higher costs than does the Appalachian Area and slightly lower costs in the production of slices. Tables 3 and 4 support the implication of these cost figures in that the Appalachian Area is gaining in sauce production relative to New York, and New York is gaining in the production of slices relative to the Appalachian Area.

The data are rather limited in many respects; however, they give clues as to the nature of costs. The information presented on cost is a snap shot of some given outputs for particular plants, and of the average outputs for several plants. Fixed costs represent only between 10 and 15 per cent of the total cost. Variable factors of production are available to all firms in the market sub-group at about the same price. The limited evidence available supports the thesis that costs are similar for different firms whose capacities vary considerably. This indicates that there are constant returns to scale of plant, and little if any economy to scale within the range studied.

In the short run, it is rather easy for a firm to expand its output. This may be done by operating more hours per day or for a longer season. While there will be a slight decline in overhead cost per unit of output, this will probably be offset by increased costs incidental to the expansion. Overtime, storage of apples, and loss of quality due to storage all tend to increase costs of operation as the firm expands its operations. From the data available it appears that, within the range of firm size studied, there are constant returns to scale, and that short-run costs curves of a given firm have a rather wide trough to their U-shape.

These generalizations relative to costs may be looked upon as hypotheses. Although the data gives support to them, there is need for further study. From what is known about the situation these hypotheses seem reasonable. Some of the reasons why costs may be expected to be different for different size firms are examined.

Selling costs immediately come to mind as being favorable to a large firm. However, apple processors do not attempt to promote brands by extensive advertising and their selling costs are low. Risk is another factor to consider. Often large processing firms draw their supplies of raw materials from a wide area and do not run the risk of depending on a particular area. However, apple processors in the Appalachian Area all depend on the same suppliers for their apples. This makes this risk the same for all sizes of processors. Often it is believed that large firms are able to use better and larger equipment than small firms or to buy factors of production at lower prices. This does not seem to be the case among processors. Each of the small processors in the area handles a volume of about one million cases annually. Most of the machinery for processing apples is of such a size that the small firms have several units of each type. All use the same source of supply for containers and pay approximately the same price. Both the data available and what is known about the situation support the hypotheses set forth.

Entry of New Firms

Cost conditions as outlined in the previous section make the entry of new firms relatively easy. Since 1939 Bowman, Byrd, and Knouse have entered the sub-group. The entry of firms in the sub-group need not cause an increase in the cost of production for the group, if costs are constant over a wide range of output or if the demand for the products is expanding. Both situations appear reasonable in the market sub-group made up of the apple processors in the Appalachian Area.

Summary

It appears that the derived demand curve for apples and the supply of apples for the market sub-group comprising apple processors in the Appalachian Area are rather elastic.

The prices paid by processors for apples result from decisions of a few processors. These processors recognize their high degree of substitutability as buyers of apples and also recognize that they all must pay about the same or idential prices. However, they customarily use

implicit price devices for minor price adjustments in an attempt to differentiate their offers.

One of the processing firms is a cooperative. It has introduced the use of patronage refunds. This has caused other firms to make bonus payments to their suppliers. This cooperative has the support of over 400 of the leading apple producers in the area.

There are indications that some of the processors take a somewhat broader view than short-run profit maximization. They consider the effect of their price on: (1) the long-run supply of apples, (2) the entry of new firms, and (3) the behavior of other firms. Such considerations tend, in the short-run, to cause a higher price for apples and a lower price for apple products.

Costs are rather uniform among processors whose outputs vary considerably. It also seems that costs for a particular firm should be rather constant over a considerable variation in output.

Entry in the market sub-group appears to be relatively easy. Three firms have entered successfully since 1939.

This gives considerable information relative to the policies and characteristics of the apple processors in the Appalachian Area. What does it tell relative to the price, output, and competitive pressure among processors in the area? The next chapter will attempt to answer this question.

Chapter VI

ANALYSIS OF COMPETITIVE BEHAVIOR AMONG APPLE PROCESSORS IN THE APPALACHIAN AREA

THE price-making units involving apple processors in the Appalachian Area has been delineated and the firms have been identified. Some of the factors which affect the competitive behavior of firms also have been identified and the practices and characteristics of the firms relative to their competitive behavior have been described. However, up to this point a rigorous examination of the amount of competition among processors in the area has not been made. In an attempt to do this, the use of theory may be helpful. Consequently, use will be made of certain theoretical concepts in analyzing the problem. Such an analysis is related closely to the problems which have occupied the attention of writers since the field of imperfect competition analysis was developed by Chamberlin and Robinson.[67]

In the analysis of this problem the market sub-group will be abstracted from the rest of the economy and it will be assumed that all other conditions are constant. That is, the assumed supply of apples and the demand for apple products will be considered as given for the sub-group under consideration. Under these circumstances the problems to be resolved are: how do the firms involved compete and at what price and output do they finally arrive?

An Analysis of Factors Affecting Competition

The extent to which excess profits exist under conditions of imperfect competition is limited by the elasticity of the demand and supply curves facing the sub-group. The more elastic the curves, the less the opportunity for excess profits.[68] It has been argued that supply and demand curves facing apple processors in the Appalachian Area are rather elastic. Just how elastic is not known. However, they are not

[67] Chamberlin, op. cit.
Joan Robinson, *Economics of Imperfect Competition*, Macmillan, 1933.
[68] Waite and Trelogan, op. cit., p. 117.

expected to be perfectly elastic. Therefore, there should be an opportunity for at least some excess profits.

Starting with the assumption that the sub-group's derived demand and supply for apples are elastic but not perfectly elastic, this chapter deals with the problems of how the firms in the sub-group evaluate the situation and how their decisions affect excess profits. The analysis is in terms of whether or not certain factors tend to apply competitive pressures in the sub-group. The effects of certain factors on the behavior of the sub-group are isolated. Finally, a summary of the situation concerning the extent of competitive pressure in the sub-group is made.

Throughout the analysis in this section the same assumed derived demand and supply relations used in Figure 2 are used. They are not proposed as being representative of the actual curves facing the group in the real world. However, they are used as a device to illustrate the effect of certain decisions of the firms involved upon the price and output of the sub-group.

As a point of departure a review of the case of duopsony, illustrated in Figure 2, Chapter II, is made. In this figure it was assumed that the two firms recognized their mutual dependence and price and output were the same as under monopsony. It has since been argued that if there are more than two firms the solution is the same as long as all of the firms recognize their mutual dependence, and as long as costs are the same as under monopsony. Although there are only a few (six) firms in the sub-group, there are indications that some firms follow policies which have an effect similar to that resulting from a failure to recognize mutual dependence. First, a further examination will be made of the case of the cooperative considered in Figure 2, page 20.

DUOPSONY, ONE FIRM BEING A COOPERATIVE

In Chapter II it was argued that if one of the duopsony firms is a cooperative, there is a tendency for the price of apples to move from the equilibrium price of P_2 (monopsony price) to P_3 (competitive equilibrium price). This in turn changes the quantity purchased by the sub-group from OB to OF. One of the factors responsible for bringing this change about is the payment of patronage refunds by the cooperative. It has been shown that with the coming of the cooperative, patronage refunds by Knouse and bonuses by other firms have become parts of the final settlement between apple sellers and processors. The introduction of patronage refunds and bonuses may be considered as the equivalent of failure to recognize mutual dependence. Chamberlin has this to say about the solution where mutual dependence is ignored: "If sellers

neglect both their indirect and their direct influence upon price, the outcome will be the purely competitive price, *regardless of numbers*."[69]

It was pointed out that the full effect of patronage refunds is dampened because refunds are made after the grower has decided how he will market his apples. However, it also was pointed out that the dampening effect will be offset to the extent that such payments were made in the past, thereby establishing a pattern and becoming a factor which the grower will consider in determining how to market his apples. Such considerations on the part of apple growers partially may explain the fact that there has been a tendency for processors to be deluged with apples in recent years.

Since Knouse pays patronage dividends, and other firms pay bonuses to their apple suppliers, it may appear that in actual practice cooperative and non-cooperative firms behave in a similar manner. However, the important point is that bonuses were initiated due to price competition from the cooperative in the form of patronage refunds. Consequently, these practices cause competition among the firms resulting in the final price tending to move from the monopsony price toward the competitive price. Implicit price devices used by processors are similar to patronage refunds used by a cooperative, in that they tend to promote competition among the firms.

EFFECT OF IMPLICIT PRICE DEALS ON COMPETITION

It may be recalled that at first these deals often are "secret" in the case of a particular processor but fail to remain secret and soon become general practices among other processors. However, it appears that such devices are effective in attracting apples and that they cause processors partially to ignore their mutual dependence. The fact that processors attempt to keep competitors from knowing about such arrangements indicates that they are attempting to differentiate their offers, and thus to some extent they are ignoring their mutual dependence. However, the fact that such practices are matched by competitors indicates that at least some competition among the firms has resulted. Thus growers' net returns have been increased, and their sales to processors have been increased.

EFFECT OF ENTRY ON COMPETITION

Since 1939 three firms have entered the sub-group. Since 1949 they have been doing between one-fourth and one-third of the processing volume in the area. How does this effect competition? An illustration

[69] Chamberlin, op. cit., p. 54

may be helpful in answering this question. The same derived demand and supply relations used in Figure 2 are reproduced in Figure 10. To simplify the illustration it is assumed that firm A, a monopsonist, is at first the only firm in the sub-group.

It may be recalled that as a monopsonist, A is faced with the same demand and supply of apples as is the sub-group. A's marginal cost and marginal revenue are equal at G and output OB. With quantity OB, A must pay price P_2. After firm B enters (which does one-fourth of the total business in the sub-group), A's relevant marginal cost and marginal revenue are equal at H and output OK. To obtain quantity OK, A must pay price P_2, the same as when A was a monopsonist. Firm B also pays P_2 and takes quantity KB, as this is also B's most profitable price and output as long as B considers its demand and supply to be one-fourth of the sub-group.

Firms A and B together take quantity OB and pay P_2. This is the same price and output solution as under monopsony. A's volume has been reduced from OB to OK, or an amount equal to KB, the purchases of B. A's excess profit has been reduced, but the excess profit for the sub-group remains the same. Therefore, the entry of B has had no effect on the price of apples, on the price of apple products, or on total excess profits for the sub-group. However, firm B has applied competitive pressure to firm A by shifting A's supply curve upward and to the left and shifting

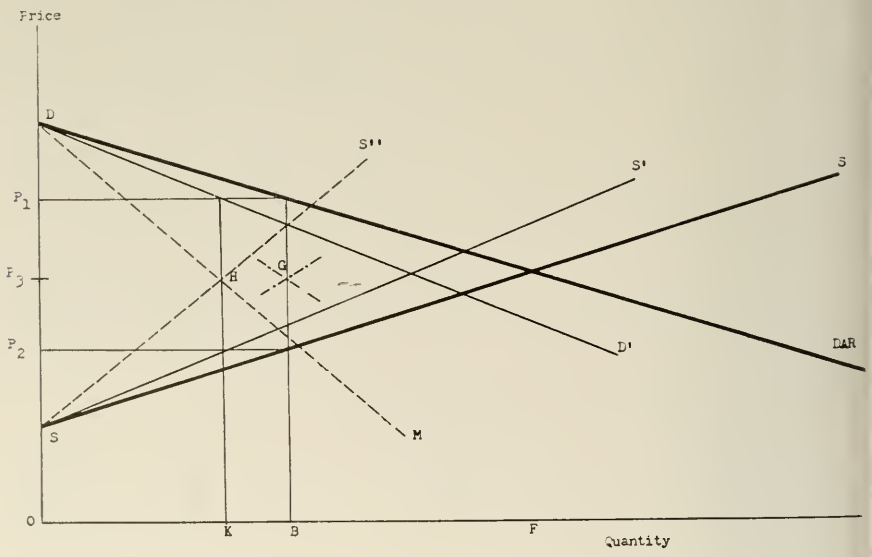

FIGURE 10. Hypothetical market sub-group—involving entry.

A's derived demand curve downward and to the left. This in turn has reduced A's profit.

Under what conditions could entry lead to a more competitive price? Chamberlin has this to say on the matter: ". . . the break towards purely competitive levels comes when the number of sellers is so large that each is led to neglect his influence upon the price."[70]

He also has this to say:

> "As their numbers increase, it is impossible to say at just what point this consideration ceases to be a factor. If there were 100 sellers, a cut by any one which doubled his sales would, if his gains were taken equally from each of his competitors, reduce the sales of each of them by only 1/99, and this might be so small as not to force them, *because* of the cut, to do anything which they would not do without it. At whatever point this becomes true, the barrier to the downward movement of price from the point which will maximize the joint profits of all is removed. No one seller will look upon himself as causing the dislodgment, since he secures his gains with comparatively little disturbance to any of his rivals. Under these circumstances there is no reason for him to withhold a shading of his price which is to his advantage, and which has no repercussions. Nor is there any reason for the others not to do likewise, and the price becomes the purely competitive one."[71]

With only six processors doing the bulk of the volume in the Appalachian Area, at first it seems unlikely that they would ignore their mutual dependence. However, a closer examination shows that there is considerable variation in the size of the processors. For example, suppose that Bowman, who does about 5 per cent of the business in the area, is considering expanding his output by 20 per cent and feels that he has to improve his offer slightly to attract additional fruit. He might feel that he is doing so small a part of the total business that other processors would ignore such a move. If Bowman should improve his offer enough to increase his volume 20 per cent what would be the final result?

He could have been correct in his evaluation of the situation. In which case other processors would ignore his move and he would find that his supply of apples would be highly elastic. In which case he might want to expand more than 20 per cent. However, as long as the other processors ignored his move, there would be little change except for his slightly improved offer for apples and his expanded output. On the other hand, Shenandoah might follow a similar policy on the same assumption as Bowman. Other firms also might follow, in which case the final price for apples could be higher and output larger. The exact solution is indeterminate in that it depends upon the decisions of the various firms involved. For example, Musselman or National might decide to set the price half-way between P_2 (monopsony price) and P_3 (competitive price) and

[70]Ibid, p. 48.
[71]Ibid, p. 49.

price could remain there the rest of the season. Hunt indicated that one of the small and newer packers started what he called a "price-war" which bought the price of sauce from $1.85 per dozen to $1.25 and the price of apples for processing from $5.00 to $2.50 per cwt.[72] However, it should be kept in mind that in 1954 conditions seemed to warrant a price adjustment, and that the larger processors may have been glad to be able to place the responsibility for such adjustments on someone else.

Edwards has the following to say about ease of entry on competitive behavior:

> "So long as entry is easy, the potential competition of new technology, new business methods, and new marketing policies tempers the behavior of the concerns already present. The effects of this potential competition are to reduce the likelihood of collusive agreement, to moderate the restrictions in agreements actually made, to lessen the restrictive effect of concentrated control over production or purchases, and to diminish the advantage which the most powerful enterprise can obtain through coercion.
>
> "In addition to thus reducing the possibilities for avoiding competition and mitigating the restrictions in anticompetitive policies, easy entry is a safeguard against routinization of industrial activities. When established competitors in a market drift into a policy of live and let live as to prices, quality, marketing methods, or the adoption of new productive techniques, invasion of the market from outside is likely to shake them from their lethargy."[73]

There are indications that ease of entry has some effect on the behavior of processors in the Appalachian Area, as was pointed out by Hunt when he implied that "newer packers" were upsetting the situation, and that his firm was paying a "high price" to discourage their activities.[74]

HOW LARGE FIRMS MAY COMBAT COMPETITION

Hunt gave as a reason for paying a high price for apples in 1954 the fact that he wanted to discourage other processors who "expand their pack far beyond their normal sales when they can buy fruit very cheaply."[75] This would imply that there are processors who ignore their mutual dependence and take more than their "share" of the supply when prices are low, and less than their share when prices are high.

How would such action by a firm affect the price and output? An illustration will show the effect. Again using the same supply and derived demand for apples in Figure 11, assume that there are two firms. One, A, behaving as Hunt outlined, and the other B, behaving as a price leader and allowing A to take all it wants at all prices. Let DD' represent the demand of firm A for apples. To arrive at B's supply of apples DD should

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[72]Hunt, op. cit., pp. 29 and 30.
[73]Corwin D. Edwards, *Maintaining Competition Requisites of a Governmental Policy*, 1st ed., McGraw-Hill, 1949, p. 186.
[74]Hunt, op. cit., pp. 27 and 29.
[75]Ibid, p. 26.

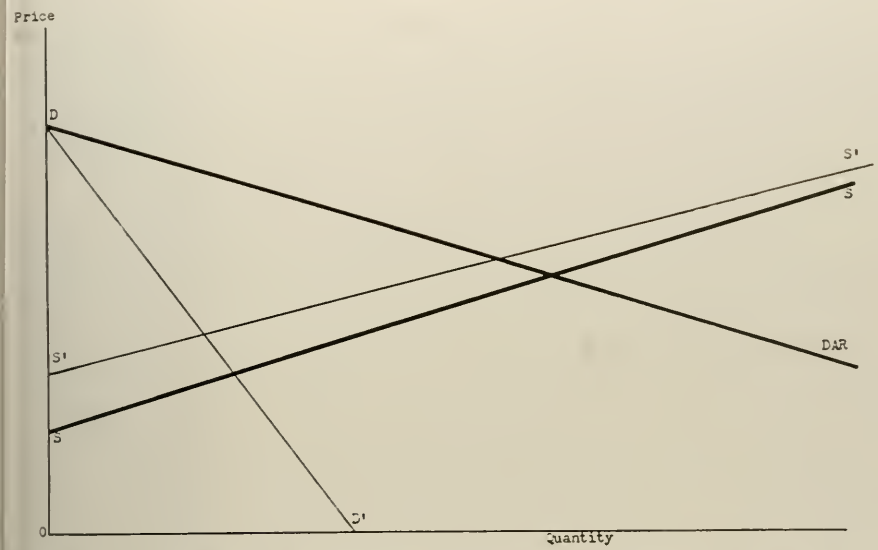

FIGURE 11. Hypothetical market sub-group—involving a competitive firm.

be substracted horizontally from SS. This gives S'S' as the supply of apples available to firm B. S'S' is more elastic than SS. Therefore the price and output will be above the monopsony price and output. Hence, a firm or group of firms behaving in this manner applies competitive pressure to the remaining firms and increases both the price and output. If the remaining firms, to combat such a situation, arbitrarily set a price higher than the monopsony price, by definition, competitive pressure has been applied. Such a price policy would increase the output both of the sub-group, and of the price leader and also would decrease the output of the small competitive firms. It would tend to discourage entry. Therefore, one way to discourage the entry of new firms is for existing firms to narrow their profit margin. Machlup has the following to say about such a policy:

> ". . . existing firms will want to be cautious and avoid showing profits that incite the envy and appetite of others. If high short-run profits are seen as a possible danger to the stability of a situation that permits the making of secure long-run profits at a more modest rate, most businessmen will forego the former to safeguard the latter. In this sense potential newcomers' competition undoubtedly exerts a restraining influence on price making and profit taking by oligopolistic sellers."[78]

It appears that this is what Hunt was attempting to do when he paid a relatively high price for apples.

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[78]Fritz Machlup, *The Economics of Sellers' Competition, Model Analysis of Sellers' Conduct* Johns Hopkins Press, 1952, p. 539.

ENTRY OF AN INTEGRATED GROWER-PROCESSOR

The entry of Byrd into the processing sub-group would have an effect similar to that of any other processor entering the sub-group. That is, it would reduce the supply of apples available to the existing firms, reduce their profits, and have no effect on price if all firms continued to recognize their mutual dependence.

What effect would it have on the proportion of Byrd's crop which would be processed? If excess profits were being made by processors when Byrd switched from selling apples to other processors to processing them himself, his orchard returns from processor apples would be increased. This in turn would cause him to process a high proportion of his apples. Therefore, he would process a higher proportion of his crop than is processed by the area as a whole. This is not the case. Byrd is processing about the same proportion of his crop as other growers in the area.[77]

Summary

In a market sub-group with a few firms, two of which do one-half the volume of the group and recognize their circular relationship, the firms could have more profits and less output than under conditions of perfect competition, assuming that costs are the same under both perfect and imperfect competition. However, there appear to be certain forces operating among processors which tend to offset the tendency toward restricting output and high profits. The evidence tends to support and confirm the thesis that the derived demand for apples and the supply of apples facing the sub-group are rather elastic. There are also indications that the relevant demand and supply relations for individual firms are more elastic than for the sub-group. The more elastic the demand and supply confronting a firm, the less the opportunity for monopoly profits.

Knouse, a cooperative, applies competitive pressure on other firms in the sub-group. When it entered in 1949, it reduced the demand and supply for the existing firms. Through the payment of patronage refunds, it, in effect, ignored mutual dependence and as a result forced other firms to pay bonuses. Patronage refunds and bonuses are considered by growers as a part of their net returns for apples. These practices increase processor price relative to fresh price and cause the growers to reduce sales to the fresh outlet and increase them to processors. The net effect of patronage refunds and bonuses is to increase the price of apples

[77] *New York Times*, November 6, 1955.

for processing. This in turn means larger output by processors. Shenandoah operates similarly to a cooperative. The operations of Byrd also are similar to those of a cooperative. Knouse, Shenandoah and Byrd do between one-fourth and one-third of the volume in the area.

Entry of new firms appears to be relatively free. Three firms have successfully entered the sub-group—Bowman in 1939, Byrd in 1948, and Knouse in 1949. There are indications that National and Musselman pay a price for apples which is higher than that which would maximize their profits in the short run. Their long-run security seems to be the reason for such a policy and it is related to the following factors: (1) discouraging the entry of new firms, (2) discouraging the expansion of existing firms, and (3) encouraging apple growers to expand their output, particularly certain desirable varieties for processing.

Finally, processors, both large and small, ignore their mutual dependence to some extent and compete through the use of implicit price devices. These devices increase the growers' net returns, they increase his sales to the processor outlet, and they soon become general practices of all, once they are introduced by a particular firm.

When all factors are considered, competitive pressure is strong and excess profits tend to be small if present at all. However, in conclusion it should be recognized that each processor does not have perfect knowledge of demand and of his own costs, and that resources are not perfectly mobile. Consequently, he may not be able at once to hit upon his best price and output. Therefore, as under pure competition, prices fluctuate in a penumbra.[78] However, it seems that the penumbra is more in the area of the purely competitive price than in that of the monopsony price.

[78]Chamberlin, op. cit., p. 26.

Chapter VII

IMPLICATIONS AND CONCLUSIONS

SUMMARIES of most chapters have been made throughout the text. The purpose of this chapter is to draw this material together, to give an over-all picture of the study and of the conclusions reached.

The market sub-group is the unit in which price is established, as defined in this study. It includes all the firms which sell (or buy) substitutable products (relatively homogeneous) and have similar structural patterns. That is, the firms are confronted by similar problems and are in relatively close competitive relationships. It is within this group that price is established.

Using the market sub-group as the basic unit of inquiry, it was found that the following groups were involved in the apple purchasing activities of processors in the Appalachian Area: (1) all apple growers in the United States are in the same market sub-group, (2) all fresh buyers in the United States are in the same market sub-group, and (3) all processor buyers in the Appalachian Area make up a third market sub-group.

Price is established by a group of buyers and a group of sellers. It was argued that the structure of the market sub-group influences price behavior. It was further argued that; (1) number of firms, (2) substituability of the product, (3) the presence of a cooperative, and (4) the ease with which a firm may enter the sub-group are all structural factors which influence price behavior. Under conditions of pure competition the individual seller (or buyer) has no measurable effect on price. Consequently, he is a price taker. He may determine how much he will produce, but he cannot determine the price at which he sells (or buys). However, under conditions of imperfect competition the individual seller (or buyer) may be able to affect price as well as output. Within this framework this study is concerned with how certain structural factors influence the behavior of the firm in determining price and output.

The pure competition model describes best the behavior of apple sellers and fresh apple buyers. There are so many sellers and buyers in the sub-group that no one buyer or seller appears to have any measurable effect on price, and has no incentive to attempt to follow an independent pricing policy. This is not the case among apple processors in the Appalachian Area.

Only a few processors comprise the buying side of their market sub-group. Although processors depend only on apple growers in the area for their supply, the pure competition model describes best the behavior of the apple grower-sellers in their relationship with processors. There are approximately 2,500 apple growers in the area. They produce about one-fifth of the national supply.

These growers not only consider any one fresh buyer as highly substitutable for any other, and any one processor-buyer as highly substitutable for any other, but they also consider fresh and processor buyers as highly substitutable.

Therefore, even though fresh and processor buyers are not considered as being in the same market sub-group, they are related closely and depend on the same area growers for their supply of apples. Since processors depend on growers in the area for their apples, and since the fresh price is established by the nation's growers and fresh buyers, processor price has little effect on fresh price. Therefore, for all practical purposes, processors in the Appalachian Area may consider fresh price as given. The quantity of apples available to processors is determined mainly by the relationship of processor price to fresh prices, Figure 9. Therefore, processors in the Appalachian Area must consider the price of a competing group of buyers (fresh price) as given and largely outside their influence. Consequently, this largely determines the price which processors must pay for any given quantity of apples, and it defines the supply curve of apples which faces processors. Under these conditions the supply curve would be elastic.

Applesauce and slices are the principal apple products produced in the Appalachian Area. About one-half of the national supply is produced in this area. U. S. Grades and Standards are used widely as a basis for determining quality of apple products. Much of the sauce and slices is sold under the buyers' labels, and the promotion of processors' brands has never been used extensively. Therefore, under these conditions, processors' derived demand for apples in the Appalachian Area is elastic. The more elastic the supply and demand curves are, the less the opportunity for excess profits. Since apple processors are confronted with elastic supply curves and derived demand curves, how much competition is there among processors and at what price do they arrive?

Certain factors are present which indicate a lack of competition which would result in the monopsony price. Other factors indicate competitive pressure toward the purely competitive price.

The following two conditions indicate a lack of competition:

1. Only a few buyers are in the sub-group, and two (Musselman and National) do about one-half of the volume of the group.

2. These few firms appear, at least partially, to recognize their mutual dependence. Either National or Musselman generally announces a price, and all other firms immediately announce similar if not identical prices. These two factors point to a lack of competition tending toward the monopsony price and output equilibrium.

The following four conditions point toward an elimination of excess profits by competitive pressure causing price to move to the purely competitive equilibrium solution:

1. In 1949, with the entrance of Knouse into the sub-group, there came the practices of patronage refunds and bonuses. Knouse, a cooperative, returns all receipts over cost of operating to its patrons on a patronage basis. The operating policies of Shenandoah and Byrd are similar to those of a cooperative and have a similar effect on the sub-group.

It was shown that five cents per cwt. is enough to cause growers to switch sales from one processor to another. Under conditions such as these the non-cooperative processors cannot afford to ignore patronage refunds on the part of a cooperative, even though such refunds are made after the crop has been marketed. Processors are concerned with their apple supply and with the relative growth of other processors in the future.

Although patronage refunds and bonuses are made after the growers have made their decision as to how they will market their crops, refunds and bonuses tend to become factors which are considered by growers in making marketing decisions because such payments have been made in the past and are expected to be made in the future. That is, after patronage refunds and bonuses have become general practice, growers not only consider the announced price but also assume that something more will finally be paid, when they are deciding what part of their crop they will sell to processors. This may explain in part as to why processors have tended to be deluged with apples in some recent years.

2. Implicit price deals, a second factor responsible for competitive pressure, are closely related to patronage refunds and bonuses. It was found that the announced price may or may not represent the final settlement between growers and processors. Implicit price deals, which

increase the growers' net, are widely used. Such deals cause the processors to ignore, at least in part, their mutual dependence and to compete among themselves. Such practices increase the growers' net returns and their sales to processors.

3. The ease of entry of new firms in a market sub-group influences the competitive behavior of the firms concerned. Since 1939, three firms have entered the sub-group. Both actual entry and potential entry appear to have a moderating effect on the decisions of firms to maximize their short-run profits. The evidence tends to indicate that Musselman and National have paid relatively high prices for apples in an attempt to combat both entry and the expansion of some of the smaller firms. Such policies indicate that processors consider long-run security as well as short-run profits when they establish price for a particular year.

4. The relative over-all costs among firms influence both the effectiveness of a cooperative and the ease of entry into a market sub-group. From the limited data available and from what is known about apple processing, there are indications that returns to scale are constant within the range of the capacity found among processors in the Appalachian Area. Also, costs for individual firms appear to be constant over their normal range of outputs. These hypotheses need further study. However, to the extent that they are correct, one firm is as efficient as any other firm. Such a situation maximizes the effectiveness of a cooperative and makes entry relatively easy.

Finally, it should be recognized that processors do not have perfect knowledge of demand and of their own costs. Also, resources are not perfectly mobile. Consequently, processors may not be able to establish immediately their best price and output. Therefore, as under perfect competition, price would tend to fluctuate around the equilibrium price. The important question is: Will the equilibrium price for processors in the Appalachian Area tend to be in the direction of the monopsony price or of the purely competitive price?

From the analysis of the situation, it may be concluded that the opportunity for excess profits in the market sub-group has been reduced if not eliminated in recent years. The bulk of the evidence indicates that competitive pressure is strong among processors. It appears that there is little opportunity for excess profits over a period of time. The indications are that processor price and output are efficient in the allocation of resources. That is, comparable resources (apples) bring the same returns as in other uses (fresh outlet).

Appendix I

SUPPLEMENTARY TABLES

TABLE 1. APPLES — PRODUCTION, FARM DISPOSITION AND UTILIZATION OF THE COMMERCIAL CROP, U. S., 1934-54.

YEAR	TOTAL PRODUCTION	PRODUCTION HAVING VALUE	FARM DISPOSITION		UTILIZATION OF SALE	
			FARM HOUSEHOLD USE	SOLD	FRESH SALES	PROCESSED SALES
			(Thousand Bushels)			
1934	106,005	104,757	7,499	97,258	73,790	23,468
1935	140,398	131,843	9,440	122,403	91,349	31,054
1936	98,025	97,295	6,364	90,931	68,991	21,937
1937	153,169	141,035	9,123	131,912	98,123	33,879
1938	105,718	101,850	6,367	95,483	75,546	19,937
1939	139,247	124,729	7,565	117,164	83,839	33,325
1940	111,436	106,811	6,673	100,138	78,195	21,943
1941	122,217	119,642	6,680	112,962	79,629	33,333
1942	126,707	118,368	6,404	111,964	77,853	34,111
1943	87,310	87,310	4,851	82,459	58,103	24,356
1944	121,266	119,225	6,113	113,112	77,808	35,304
1945	66,686	66,686	2,906	63,780	47,264	16,516
1946	118,901	118,394	5,406	112,988	75,658	37,330
1947	112,892	108,422	4,846	103,576	77,207	26,369
1948	89,330	88,497	4,155	84,342	64,887	19,455
1949	134,002	122,073	4,597	117,476	81,235	36,241
1950	124,488	120,610	4,494	116,116	76,620	39,490
1951	110,660	101,047	4,794	95,253	68,921	27,332
1952	92,489	92,489	4,037	83,152	64,501	23,951
1953	93,307	93,307	3,880	89,427	62,948	26,479
1954	109,512	109,212	4,479	104,733	66,505	38,228
Average	112,560	108,267	5,746	102,520	73,761	28,759

Source of Data: *Fruits (Noncitrus) Production, Farm Disposition, Value and Utilization of Sales,* (United States Department of Agriculture), Issued as follows: 1889-1941, May 1948; 1944-49, October 1952; 1950-1951, July 1952; 1951-1952, July 1953; 1952-1953, July 1954; 1953-1954, July 1955.

Table 2. Apples — Production, Farm Disposition and Utilization of the Commercial Crop, Appalachian Area, 1934-54.

Year	Total Production	Production Having Value	Farm Disposition		Utilization of Sale	
			Farm Household Use	Sold	Fresh Sales	Processed Sales
			(Thousand Bushels)			
1934	21,006	21,006	1,936	19,070	13,078	5,992
1935	32,048	31,448	2,701	28,741	20,065	8,679
1936	20,426	20,426	1,771	18,655	12,523	6,132
1937	34,399	31,432	2,450	28,982	19,624	9,358
1938	21,973	21,973	1,724	20,249	15,350	4,899
1939	28,569	25,679	2,088	23,591	15,107	8,484
1940	25,985	25,725	1,842	23,883	17,232	6,651
1941	26,892	26,892	1,823	25,069	14,371	10,698
1942	30,219	27,834	1,866	25,968	14,822	11,146
1943	13,098	13,098	1,245	11,853	6,120	5,733
1944	28,571	27,779	1,793	25,986	13,511	12,475
1945	8,808	8,808	608	8,200	4,216	3,984
1946	27,936	27,736	1,619	26,117	12,500	13,617
1947	14,858	14,858	1,003	13,855	7,258	6,597
1948	16,170	16,081	940	15,144	8,572	6,572
1949	21,861	21,201	944	20,257	9,537	10,720
1950	24,537	24,253	1,096	23,157	10,562	12,595
1951	22,093	20,181	1,121	19,060	10,892	8,168
1952	19,129	19,129	999	18,130	10,062	8,068
1953	14,541	14,541	843	13,698	6,585	7,113
1954*	24,520	24,220	1,305	22,915	10,574	12,341
Average	22,745	22,110	1,510	20,599	12,027	8,572

* Maryland not included.

Source of Data: *Fruits (Noncitrus) Production, Farm Disposition, Value and Utilization of Sales*, (United States Department of Agriculture), Issued as follows: 1889-1944, May 1948, 1944-49, October 1952; 1950-1951, July 1952; 1951-1952, July 1953; 1952-1953, July 1954; 1953-1954, July 1955.

TABLE 3. APPLES — SEASONAL AVERAGE PRICES RECEIVED BY GROWER BY TYPE OF OUTLET, APPALACHIAN AREA, 1934-54.

YEAR	PRICE PER BUSHEL	
	PROCESSOR	FRESH
	(Dollars)	
1934	0.36	1.16
1935	0.20	0.91
1936	0.38	1.31
1937	0.18	0.80
1938	0.18	0.99
1939	0.19	0.86
1940	0.21	0.96
1941	0.35	1.28
1942	0.47	1.61
1943	1.00	3.77
1944	0.93	2.87
1945	2.27	3.41
1946	1.36	2.78
1947	1.23	2.43
1948	0.84	2.32
1949	0.69	1.80
1950	0.90	1.93
1951	0.60	1.79
1952	1.28	2.34
1953	2.05	3.21
1954*	1.24	2.12

* = Maryland not included.
Source: Calculated from United States Department of Agriculture Crop Reporting Board Data.

TABLE 4. AVERAGE FOB PRICES RECEIVED BY MUSSELMAN AND NATIONAL BY MONTHS FROM SEPTEMBER 1948 TO AUGUST 1951 FOR APPLE SAUCE.

YEAR AND MONTH	CAN SIZE					
	#303		#2		#10	
	M	N	M	N	M	N
	(Dollars Per Dozen)					
1948-49						
Sept	1.10	1.15	1.20	1.25	6.00	6.30
Oct	1.10	1.15	1.20	1.25	6.00	6.30
Nov	1.15	1.25	1.25	1.35	6.20	6.40
Dec	1.15	1.25	1.25	1.35	6.20	6.40
Jan	1.30	1.25	1.35	1.35	6.50	6.40
Feb	1.30	1.25	1.35	1.35	6.50	6.50
Mar	1.30	1.25	1.35	1.35	6.50	6.50
Apr	1.30	1.25	1.35	1.35	6.50	6.50
May	1.30	1.25	1.35	1.35	6.50	6.50
June	1.30	1.25	1.35	1.35	6.50	6.50
July	1.30	1.25	1.35	1.35	6.50	6.50
Aug	1.30	1.25	1.35	1.35	6.50	6.50
1949-50						
Sept	1.15	1.15	1.25	1.25	6.00	6.00
Oct	1.15	1.15	1.25	1.25	6.00	6.00
Nov	1.15	1.15	1.25	1.25	6.00	6.00
Dec	1.15	1.15	1.25	1.25	6.00	6.00
Jan	1.15	1.15	1.25	1.25	6.00	6.50
Feb	1.20	1.20	1.30	1.30	6.50	6.50
Mar	1.20	1.20	1.30	1.30	6.50	6.50
Apr	1.20	1.20	1.30	1.30	6.50	6.50
May	1.20	1.20	1.30	1.30	6.50	6.50
June	1.20	1.20	1.30	1.30	6.50	6.50
July	1.20	1.20	1.30	1.30	6.50	6.50
Aug	1.20	1.20	1.30	1.30	6.50	6.50
1950-51						
Sept.	1.30	1.30	1.45	1.45	6.90	6.90
Oct	1.30	1.30	1.45	1.45	6.90	6.90
Nov	1.30	1.30	1.45	1.45	6.90	6.90
Dec	1.30	1.30	1.45	1.45	6.90	6.90
Jan	1.30	1.30	1.45	1.45	6.90	6.90
Feb	1.30	1.30	1.45	1.45	6.90	6.90
Mar	1.30	1.30	1.45	1.45	6.90	6.90
Apr	1.30	1.30	1.45	1.45	6.90	6.90
May	1.30	1.30	1.45	1.45	6.90	6.90
June	1.30	1.30	1.45	1.45	6.90	6.90
July	1.30	1.30	1.45	1.45	6.90	6.90
Aug	1.30	1.30	1.45	1.45	6.90	6.90

Source: OPS Records.
M = Musselman
N = National

Appendix II

SUPPLEMENTARY MATERIAL

Historical Background of Knouse Foods Cooperative, Inc.

THE following testimony of Mr. Knouse before the FTC hearings gives an interesting review of his background in connection with apple processing and the organization of the cooperative:

"In 1925 I was a director in the First National Bank at Gettysburg. That bank inherited a canning factory, through a sheriff's sale, that was organized by a group of growers, by a rather swindler organization that had swept the country known as Northwestern Manufacturers Association.

"I was asked by the bank to go out and put this institution on its feet and it wasn't very long until I discovered that a National Bank could not operate a canning factory, and so the bank asked me to take it over and run it.

"The first attempt was to organize a partnership between myself and an uncle which lasted about thirty days and then I organized the Knouse Corporation and that continued until 1929.

"In 1929 I decided I owed New York banks too much money after the crash and I sold the majority interest in the business to the National Fruit Company and we operated as a subsidiary of National Fruit Products Company from 1929 to 1947 and the year 1947 we changed the name to Northern Division of the National Fruit Products Company and operated as a completely owned subsidiary.

"In 1949 National Fruit Product Company sold its Northern Division to a group of farmers, of which-I was one of them, and the Charter was taken out in the name of Knouse Foods Cooperative, Inc. . . . I am president of the cooperative which is owned by about 400 apple growers."

Source: FTC Docket No. 6041, pages 1743-1745.

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